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ON RELIABILITY IN POLLING

A Sociometric Study of Errors of Polling in War Zones

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Abstract

At the request of the Allied authorities, surveys were conducted in Syria and later in Sicily to test the reliability and utility to administrators of public opinion polls in occupied territories.

Reliability was operationally defined in terms of agreement of reobservations. The various dimensions of reliability were observed as errors correlated with 1) informants, 2) interviewers, 3) their interrelations, 4) schedules, 5) media, 6) dates, and 7) residual errors. Interrelations were further analyzed into differences of language, sex, sect, status and two degrees of acquaintance as in the informant and interviewer being either personal friends or strangers. Novel among the indices to measure each dimension was the probability, P, of goodness of fit of two distributions from a survey and a resurvey, as this measured agreement a) for all statistical moments simultaneously, and b) between schedules of miscellaneous qualitative items mixed with quantitative items.

Experimental designs eliminated each error or isolated each in turn for measurement. This report emphasizes the statistical techniques for measuring the more strictly sociometric errors, especially the effect of friendship and its correlated sincerity of response upon these polls among former enemies.

The outstanding finding on almost all questions was of imperfect reliability when reobserving the individual (63%-81%) but almost perfect reliability (99%) when reobserving the plurel.

A. The Problem of Unreliability in War Zones

Several polls of public opinion have been held in the Middle East and Mediterranean theater, in part for the purpose of determining the feasibility of polling in liberated, cobelligerent, or enemy territory. The question at issue was whether valid and reliable civilian intelligence, needed by the administrative and propaganda authorities in wartime, could be gathered by public opinion polls in a population, of whom many were enemy sympathizers. The present paper is not concerned with the content of the enquiry, nor with its main purpose of exploring the military utility of polls in occupied territory, but only with the methodology. It is a report on the

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technics developed to isolate and measure the chief factors of reliability in interviewing. These technics apply to sociometric research generally and transcend these specific surveys.

For the first poll, radio listening habits were chosen as a non-political issue, to be polled in Syria and Palestine which were territories with pro-Axis factions and accessible at the beginning of 1943. A ten percent sample of the radio public was surveyed. No public opinion poll had ever been held among this Arab population, so that the novelty of it might be one source of suspicion. The people in those countries have much less of a tradition of free speech, conducive to frank and fearless replies to a stranger's questioning, than in Anglo-Saxon countries where polling has chiefly developed. Part of the area had recently been a battle-ground and occupied by a liberating army, and the tensions of war and restriction of censorship, with political concentration camps in the vicinity, were expected to increase the tendency of these people to calculate possible consequences to themselves and to consider what the surveyors might want them to say before answering the interviewer's questions. Another source of insincere responses which were expected to lower the reliability and validity was certain nationalistic feelings against the two mandatory powers, whose radio stations and governments joined in sponsoring the poll.

As a result of the success of the Syrian poll, further exploratory surveying in Sicily was requested by the authorities. In a three-month trial a hundred Italian interviewers and clerks under Anglo-American officers were trained, and a polling organization developed. Eight surveys were carried out on a tenth of one percent sample of the four million Sicilians. They covered shelter conditions after the bombing, clothing needs, food rationing and distribution, confidence in public officials, public security, public information, radio listening, and cobelligerency.[1]

B. THE DIMENSIONS OF RELIABILITY

Reliability was defined as the degree of agreement among reobserva-

[1]The Syrian poll was reported in "A Pioneer Radio Poll in Lebanon, Syria and Palestine," by Stuart C. Dodd and Assistants, American University of Beirut, Lebanon, 1943: pp. 103. This is a public document as the poll was conducted by a University research staff with the sponsorship, on behalf of the United Nations' radio stations, of the seven governments involved in that region.

The 148-page report on the Sicilian surveys has the military classification of a "Confidential" document, and so at present (Feb. 1944) has only a limited distribution. Questions about the scientific technics may be sent to the Director, Stuart C. Dodd, care of the Publicity and Psychological Warfare Division, Supreme Headquarters, Allied Expeditionary Force.

tions under specified conditions. Its complementary aspect is unreliability, or error, which is whatever decreases agreement among reobservations. Each specified condition of reobserving defines one dimension of reliability. The length of each dimension is composed of two segments—the degree of agreement and the residual degree of disagreement. If perfect agreement is called 100%, each dimension will comprise a percentage of agreement and its complementary percentage of error. Indices for measuring the length of a dimension are described below.

In sociometric situations the chief dimensions of reliability are most observable as the errors, or variation, in:

1. The informants ⎱
2. The interviewers ⎰   Populational dimensions

3. Their interrelations ⎱
4. The schedule cards ⎰   Indicatory dimensions

5. The media of communication   Sensori-spatial dimensions

6. The dates of interview   Temporal dimensions

7. Residual factors   Indicatory dimensions[2]

1. As the informants vary, their individual differences yield sampling errors whenever data about a whole population are inferred from a part of that population.

2. As the interviewers vary, their individual differences yield observation errors due to the human instrument.

3. As each interperson relation between the interviewer and the informant varies, this variation yields interrelation errors. This dimension of reliability has been largely neglected and unmeasured hitherto. The most important types of interrelation were conditioned by:

   a) Differences of language. Among the many languages in Syria and Palestine the interviewers must among them be able to speak the language of any informant.

   b) Differences in sex. In Moslem households a male caller may not talk with a woman and cannot enter if the menfolk are absent.

   c) Differences of sect and nationality. Foreigners, Jews, Arabs, Moslems and Christians were best approached by members of their own in-group.

   d) Differences in status. The interviewer was respected in propor-

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[2] The theoretical considerations underlying this dimensional analysis are more fully developed in the author's "Dimensions of Society," (Macmillan, 1942 pp. 944).

tion as his social, economic and educational status was equal to or higher than, that of the informant.

e) Degree of acquaintance. Under wartime conditions the informants were expected to talk more sincerely and frankly to a personal friend than to a stranger. Suspicion and fear were very real, with the proximity of concentration camps, full of political prisoners.

4. The various schedule cards used in any survey specify the questions surveyed and so define the opinion or behavior that is observed. When one schedule card or instrument of observation is correlated with another well established one, the latter is called a criterion, and the former is said to be "valid" in proportion as it correlates with the criteria. "Validity" is thus made a sub-class of "reliability," since validity is the special case of reobserving with a different indicator of the same phenomenon.

5. As the media of communication vary from face-to-face interviews, to telephonic conversations, and to mailed questionnaires, the sensory distance of the communicators varies from being within full sight and hearing of each other, to being partially within hearing range only, and finally to being beyond either sense directly, and dependent on mediating symbols. As the sensory distance between the interactors increases, the informants' interest is apt to decrease and many errors of polling can be best measured as correlated with the medium of communication.

6. As the dates between observations vary, their intervening events yield errors of change, or unreliability that is correlated with the time interval.

7. A residual dimension of reliability provides for all the error which is unanalyzed as yet, and which awaits further research to be isolated, measured and controlled.

These seven chief dimensions of sociometric reliability are highly general in qualitative classification, but vary in quantitative degree from one situation to another. To measure the quantity of error (the length of each dimension) in a given investigation, many indices of reliability are available. Of these, four main types are most useful—two for measuring the reliability for the individual, and two for the plurel, *i.e.* for any category of people, while each pair has one index for quantitative and another for both quantitative and qualitative distributions.   These indices are:

a) *For the plurel:*

1) The significance ratio of a difference in indices, interpreted in a probability index, P.

2) The goodness of fit of two distributions, the chi square test interpreted in a probability index, P.

b) *For the individual:*

3) The reliability correlation, r.

4) The proportion of discrepant responses, d.

As all of these measure the agreement of two observings of the same phenomena, they may be called *agreement indices*. They have the property in common of ranging in value from zero to unity, with absence of agreement to perfect agreement, or with absence of probability to perfect probability of agreement. The significance ratio and reliability correlation are customary indices for quantitative variables. As the other two indices are less customary as measures of reliability, some description of them may be useful here.

The proportion of discrepant responses, d, may be described as applied to the radio poll in Syria. The schedule card in this radio poll had more than a hundred items of response, whether checking a "yes," or a "no," or entering a number. The schedule card recording the first interview was compared with the card recording the second interview, and the number of items marked differently, regardless how great the discrepancy, were counted and reduced to a percent of the possible number of discrepancies. These percents were averaged for the plurel of N persons. This percent of discrepancy for the individual measures what will be called the *individual error*. Its complement, d', measures the "individual reliability" (100—d=d').

In addition to this individual error, there is the *plurel error*, or unreliability for the plurel of N individuals. The frequency distribution of the answers to a question represent the answer of the plurel to that question. To the extent that the frequency distribution differs on reobservation, the plurel's reliability is low. To compare the two distributions the chi square is calculated and the goodness of fit probability, P, is read from a chi square table. This P is the probability that the two distributions may be samples from one parent population. It is a convenient index to measure the degree of approach to identity in the two distributions. As P approaches unity, the reobservations of the plurel agree, and there is no plurel error.

The individual and the plurel errors have a one-way relation. If there are no individual errors, there can be no plurel errors. But the converse is not true. If there are no plurel errors, there still may be (and usually are) individual errors. For these individual errors may cancel each other

out so that the distribution curve is unchanged, even though the individuals exchange places within it.

These two indices were used chiefly because they applied alike to both qualitative and quantitative variables in the schedule card, which is usually composed of both kinds of variables. Thus whether the question had qualitative answers, such as "Which broadcasters do you like?" or a quantitative answer, such as "How many times a month do you listen to. . . . ?" the same index could be used to compare their reliabilities.[3]

C. Control of Reliability

Specifying the various dimensions of reliability and the measuring of each constitutes the *identifying* type of operational definition. The other type of operational definition requires specifying the procedures and materials for *producing* or modifying that which is defined. These specifications are summarized for the various dimensions of sociometric reliability in the tabulation in Figure 1.

The topics in the middle column of the tabulation specify in outline the procedures and materials to produce greater reliability. These specifications are expanded in detail, of course, in manuals on social research, and in the two survey reports already cited. They have been tabulated here merely as part of a systematic study of reliability in one investigation. In general, these operations to produce reliability are of two types: either one *selects* the factors to be as desired, or one *modifies* them by appropriate administrative procedures. All these operations to control reliability were carried out in the surveys as described in the printed reports.

The summarizing topics in the last column specify how to measure the degree of reliability that has been produced. This constitutes the identifying

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[3]A second reason for choosing the goodness of fit test is that it seemed a more rigorous test for the degree of similarity in all respects of the two frequency distributions from the plurel that is twice observed. For the fit can only be good, and P approach unity, when each of the statistical moments in one distribution tend to equal its counterpart in the other distribution. This implies that the two means must be equal, *and* the two standard deviations must be equal, *and* the two skewnesses must be equal for P to be unity. To test the difference in the two means in the usual way by dividing it by its standard error and finding the probability of the significance ratio, leaves the equality of the second and of higher moments undetermined. The means may not be significantly different, but the variances may differ significantly. The goodness of fit seems to summarize the fit of the various moments all in one index. Since, however, its use as an index of reliability seems unorthodox, it is described here to invite criticism of this procedure.

FIGURE I

SUMMARY OF OPERATIONAL DEFINITIONS OF SOCIOMETRIC ERRORS

Dimensions of reliability	Operations *i.e.* specifying the procedures and material:	
	A. To produce the reliability	B. To measure the reliability
	Make the population sample:	Compute the appropriate "indices of agreement" when other errors are controlled between resurveys comparing:
1. Informant or sampling error.	a) Adequate in size. b) Representative in composition. c) Identical if repeated; *i.e.* a Panel.	a. Same and different samples varying in size and composition.
2. Interviewer or observer error.	a) Select competent persons. (by interviews, application blanks, aptitude tests; etc.) b) Train the interviewers (up to standard set by achievement tests). c) Use identical teams (for comparison of groups or resurveys).	b. Same and different interviewers.
3. Interrelation errors. Due to differences, especially if with inferiority, in: a) Sex, b) age, c) colour, d) language, e) sect, f) nationality, g) occupation, h) status also due to:	a) Select interviewers of classification identical or superior to the informants', wherever this matters. b) Enhance interviewers' status by dress, introductions, endorsements, honorific symbols. Guide a) and b) by tests of social distance and status.	c. Same and different inter-relations, *i.e.* differences in classification.
i) Degree of acquaintance.	a) Select friends or strangers as interviewers. b) Develop acquaintance by introductions, visits, publicity, etc.	d. Two degrees of acquaintance (*i.e.* friends and strangers).
j) Conditions of interviewing.	a) Select or arrange favourable conditions	e. Same and different conditions.
k) Procedures of interviewing.	a) Teach techniques of skillful interviewing up to a standard of $x\%$ of interviews completed.	f. Same and different techniques.

FIGURE I (Continued)

Dimensions of reliability	Operations *i.e.* specifying the procedures and material:	
	A. To produce the reliability	B. To measure the reliability
4. Schedule card errors Validity.	a) Specify a criterion; an accepted index of the phenomena to be measured. b) Define the phenomena operationally. i) Standardize questions and answers; ii) Discover ambiguities from field tests; iii) Prepare a Manual of Instructions.	g. Same and different schedules (criteria).
5. Media errors.	a) Select media with minimal sensory distances.	h. Same and different media.
6. Temporal errors.	a) Select identical dates or minimal intervals.	i. Same and different dates.
7. Residual errors (still unisolated).	a) First step. Analyse and invent hypotheses.	j. Invent experimental designs.

type of operational definition since as identification becomes more exact it merges into measurement. The operations to calculate the agreement indices, which were described above, are specified more fully in statistical text books. But the operations, including the experimental designs by which the variables are observed and fed into the statistical formulae, require further specifying. This is discussed in Section D, in which the principles just outlined are applied to the wartime surveys made in the Mediterranean theater.

D. Measurement of Reliability in the Syrian Poll.

The remainder of this paper passes from theory to application in describing how the indices for measuring each dimension of reliability were carried out in the Syrian poll of radio listening habits. The general principle running through all these measurements was to isolate each error as free as possible from the other five identified errors and measure it as it varied alone. Usually its variation was still at the primitive all-or-none level of comparing the absence of the error with its presence in some specified way. Thus, false responses may be expected to be absent between friends, but possibly present between strangers under the local war conditions.

For most dimensions of reliability, however, the measurement of errors is more complicated in that it requires three sets of observations—one to

establish the data at a given point on the dimension at issue, a second set of observations to determine how much the data change on mere resurveying at the same point on that dimension, and a third set to determine how much *more* the data change for a different point on that dimension. This isolates the difference in the dimension from other uncontrolled factors which usually vary in any repetition of a survey. Thus, for example, in the sample shown in Figure 3 three interviews of each informant were required to isolate the acquaintance dimension and measure it separately from other dimensions of reliability. If one survey, using strangers as interviewers, had been compared only with a second survey, using friends of the informants as interviewers, the difference would have measured the difference in the acquaintance relation plus other differences or errors which are inherent in mere repetition of a survey, even when all conditions are apparently identical. Hence a survey by friends was compared with a second survey by the same friends to isolate and measure the errors inherent in mere repetition. Then the difference with a third survey by strangers measured the acquaintance plus repetition errors. Subtracting the repetition errors from this isolates the amount of error along the acquaintance dimension.

In generalized terms, a first survey establishes data, a: a second survey, under apparently identical conditions, establishes data a+e, the e representing errors inherent in mere repetition, *i.e.* variations escaping control between surveys: and a third survey, although apparently changing only by the difference, d, actually establishes a+e+d. In order to isolate the d, the difference between the first and second survey, a+e—a=e, must be subtracted from the difference, a+e+d—a=e+d, between the first and third surveys, giving e+d—e=d. In the example above, d is the difference between friends and strangers, *i.e.* it is the acquantance variable observed in a primitive all-or-none way. (These formulae assume, as a first approximation, that the errors are additive and uncorrelated. If otherwise, the formulae become more complicated).

1. *Sampling errors.*

a) Adequacy of sampling.   The adequacy of the size of a sample is usually measured by calculating the significance ratio of an index or its fiducial limit. A more rigorous test of adequacy was made in comparing the goodness of fit indices from the distributions of a sample with its subsamples. To the distribution curve of a thousand cases as a criterion, the distributions of five hundred cases, of four hundred cases, of three hundred, of two hundred, and of one hundred, were fitted

on each of the more important questions. As the median probability index, P, was .99, even down to the sample of one hundred in both the Syrian and Sicilian surveys, the conclusion was that the sampling could be cut to one-tenth and still kept to within one percent of the same degree of accuracy. This indicated reducing the Syrian sample from ten percent to one percent of radio listeners, and reducing the Sicilian sample from .1% down to .01% of the citizenry. These findings answer the major question in these trial polls, namely as to the cost of further polling, since about half the budget varies directly as the number of interviews.

Another more economical way of determining the adequate size would be to ask, "What is the smallest sample whose distributions fit those of another equal sample with a probability of .99?" and then to explore successively larger samples until that standard is met.

b) Representative sampling.
The answers to the more important questions were broken down in respect to region, sex, and in some cases in respect to occupation and age. On these questions and in these respects the extent to which the reliability depends on the composition of the sample is exactly determinable. For the new means and other indices could be readily calculated for a sample of any other composition in these respects by reweighting the components appropriately from the breakdowns.

For a simple example of this, suppose the average number of occasions per month of listening to the radio were found to be 20 for men and 30 for women, in a sample composed 45% of men and 55% of women. The average for that whole sample, calculated without regard to sex, would automatically weight the men's mean by the factor of .45 and the women's mean by the factor of .55, to yield 25.5 as the general mean.

$$20 \times .45 = 9.00$$
$$30 \times .55 = 16.50$$
$$\overline{25.50}$$

But if the true proportions of the two sexes in the population were known to be .5 and .5, the true mean for the whole population is readily recalculated and found to be 25. occasions of listening per month.

$$20 \times .5 = 10.0$$
$$30 \times .5 = 15.0$$
$$\overline{25.}$$

Three indices were used in studying the representativeness of sampling:

1) a correlation (r) or contingency coefficient between the answers to one question, X, and a characteristic, Y, suspected of creating bias;

2) a goodness of fit probability, P, between the proportion of a characteristic or its subclasses, Y, in the parent population and those proportions in a sample;

3) a significance ratio, (t), of a difference between any index as calculated from a biassed sample and as recalculated from an unbiassed sample, as above.

The correlation diagnosed the relevant characteristics, Y, which had to be representatively sampled, *i.e.* whose proportions had to be matched in the parent population and in the sample.

From experience to date, a correlation greater than .5 is taken to indicate a characteristic which must be representatively sampled. Thus, if sex correlates with a question above .5, then the sexes must be sampled in proportions matching those of the parent population.

The goodness of fit test measured how well the matching of proportions had been done.

The significance ratio measured in standard scores, the amount of bias. A bias was defined as any characteristic which is unrepresentatively sampled (to the extent of P being less than .5) and which correlates greater than .5 with the answers to a question. These three indices made it possible to deal with any bias with quantitative precision by a) detecting any bias (r), b) measuring its amount (P), and c) measuring its effect in distorting the findings (t).

2. *Informant and interviewer errors.*

The informant error and the interviewer error were measured separately and in combination by the experimental design below (Figure 2). The informant error occurred in a somewhat special form, namely in the difference between members of one family. In the radio poll the unit of observation was the family, and the informant error became the unreliability in observing the family by questioning one member of it. The experimental design in the case of the Syrian survey yielded the following results:

FIGURE II
EXPERIMENTAL DESIGN FOR THE "QUADRUPLE" SAMPLE

Interviewers	Informants			
	C	D		N=182 informants
A	AC_1	AD_2	AC_1—AD_2	Informant discrepancies for constant interviewer:
B	BC_2	BD_1	BC_2—BD_1	Individual reliability d'=65%
				Plurel reliability P=99%

AC_1—BC_2 AD_2—BD_1

Interviewer discrepancies for
Constant informant:

BC_2—AD_2 = Combined interviewer and informant discrepancies:
AC_1—BD_1

Individual reliability d'=81%   Individual reliability d'=63%
Plurel reliability   P=99%   Plurel reliability   P=99%

Here A and B represented two interviewers who visited a household together, in which they found two informants, C and D who were both willing to be interviewed and immediately reinterviewed by the other interviewer. Subscripts 1 and 2 represent a first and a second interview. Thus AC_1 denotes the answers of informant C in his first interview, which is with interviewer A. BC_2—AD_2 denotes the percentage of discrepancies in the answers of informant C interviewed by B, compared with the answers of informant D interviewed by A. From this design horizontally calculated discrepancies, d, measure the informant error with the interviewer the same. Vertically calculated discrepancies measure the interviewer error with the informant the same (but not necessarily constant in his answering!) Diagonally calculated discrepancies measure both errors in combination. In all three cases these errors are isolated; all other errors are controlled since the medium (interviewing), the schedule, and the interrelations between the informant and interviewer are constant and the time interval is zero.

The outstanding finding was the large individual error, (d), and the negligible plurel error (P). When the interviewer changed, a reinterview showed 19% of fluctuations in the answers. But the two distribution curves fitted each other with a probability above 99%. When the informants were two different members of one family the discrepancies almost doubled, running up to 35%. But again the two distribution curves fitted each other with the probability above 99%. When both interviewers and in-

formants were different in the reinterview, the discrepancies only rose to 37%, and this 2% of increase was statistically insignificant. The curves again fitted each other with 99% probability. Apparently the discrepancies were sufficiently random fluctuations as to cancel each other out, leaving the distribution of answers almost identical for the same or different informants or interviewers. This high reliability for the plurel is of chief interest to the broadcaster and administrator who must act on the basis of proportions of the population whose opinions are pro and con, and not on the basis of individual opinions.

A further technique broke down the interviewer error into one of its components, and isolated this component for measurement. The component was the "recording error," *i.e.* the discrepancies between different interviewers in recording one and the same interview. The interviewers witnessed one interview in common, and their schedule cards recording it were compared, and the discrepancies calculated as a percent of all the possible discrepancies. Early in the training period this test yielded some 10% of discrepancies, but at the end of the training it was reduced to 3% in both Syria and Sicily on the radio schedule (and to .6% in Sicily on a mixed schedule of 230 questions dealing with food, shelter, clothing, public officials and news dissemination). This indicates that differences in recording between different interviewers was only a small fraction of the interviewer error (three out of nineteen percentage points). The balance of the interviewer error seems to appear in the mere repetition of the interview, *i.e.* the intrinsic fluctuation of the opinions in the informant. For the next experiment found 25.5% of discrepancies in the Syrian radio schedule on reinterviews where both interviewer and informant were identical, but where an average interval of 9.4 days intervened.

3. *Interrelation errors.*

In the experiment shown below the main point was to measure the error due to the interpersonal relation of acquaintance. Degree of acquaintance was measured as an all-or-none variable by observing it in the interview between friends and again in the interview between strangers. An informant may be expected to tell his true opinion to his personal friend more frankly and sincerely than to a stranger, especially under war conditions in the Arab East. Thus the interview with a close friend was taken as a criterion of true opinion against which to validate the opinion given to a stranger in the usual course of surveying. A sample of 374 personal friends of the interviewers were interviewed three times—twice by their

friend and once by a stranger. The sequence factor was properly rotated so as to cancel out. Here, in the two interviews by the same friend, even though the informant, interviewers, interrelation, schedule, and medium were constant, and the mean time interval was 9.4 days, yet 25.5% of discrepancies were found. Compared with this, 28% of discrepancies—constituting a small but statistically significant 2.5% excess over the 25.5% above—were found between the two interviews, one of which was with a stranger and one with a friend, (with the same mean time interval of 9.4 days). This differential of 2.5% is due to the two errors of differing degrees of acquaintance and different interviewers. These two errors were inseparable in this experimental design since the interviewing friend and the interviewing stranger had to be different persons.[4] The conclusion from this measurement of the acquaintance error is that it is very small, the 2.5 points being only about 10% of the total discrepancy observed in this experiment (Figure 3).

Another statistical technique, which converges to the same conclusion, was to calculate the correlation between the degree of acquaintance and the amount of individual error. Taking each of these as all-or-none variables the following experimental design resulted.

FIGURE III
EXPERIMENTAL DESIGN FOR THE "TRIPLE" SAMPLE

| | | Friendship | | | |
		Present (Friends)	Absent (Strangers)		
Individual error, *i.e.*	Present	13%	14%	27%	$r = .02$
discrepancy in responses.	Absent	37%	36%	73%	$\sigma_r = \pm.05$
		50%	50%	100%	$N = 374$

The contingency coefficient and the fourfold correlation coefficient here were both .023, showing that the presence or absence of friendship was unrelated to the presence or absence of error. Reliability was uncorrelated with the degree of acquaintance in interviewing. The variation of this interpersonal relation is thus shown not to have affected the findings of the survey.

A third statistical technique, which again converges to the same conclusion, measures these individual discrepancies in answers by the same

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[4]Another technique would start with a stranger and develop friendship in semisocial revisiting and thus permit comparison (with a time interval, however) between the stranger relation and the friend relation, with the interviewer constant.

goodness of fit test by which the plurel error was measured. The all-or-none distribution of discrepancies observed between friends was fitted to the same distribution observed between strangers, *i.e.* the first column in Figure 3 was fitted to the second column. The probability of fit was .99, showing that the two distributions can be considered as drawn from the same universe with practical certainty, or, stated differently, that the differences between the two degrees of acquaintance could be attributed entirely to random fluctuations of sampling.

All this meant that the plurel of Syrian informants gave their opinions as sincerely to the ordinary interviewer, coming as a stranger, as they did to a personal friend. This established the validity of the public opinion poll by the sociometric criterion of friendship which is assumed to be highly correlated with sincerity or truthfulness in the informant.

The acquaintance error was the only interrelation error whose variation was isolated and measured. The other interrelation errors were administratively controlled and eliminated. The interviewers were selected so as to eliminate unsuitable differences in respect to language, sex, sect and nationality, and status. Furthermore, in the experiment shown in Figure 3 where the same interviewer revisited the same informants, all these interrelations were constant.

4. *Schedule and media errors.*

The next two sources of unreliability—the schedule and media errors— were not as fully measured. The schedule was checked on several specific questions against other schedules and surveys, and showed closely comparable findings. But these checks were not general enough nor rigorous enough in measurement to report as a contribution to systematic technics. For the media error an experimental design, such as in Figure 2, was started to compare interviews with mailed questionnaires when isolated from the racial-linguistic differences between Jews and Arabs in Palestine, using, 1,516 interviews with Arabs and 2,761 questionnaires from Jews. But the usual difficulties of time and funds precluded carrying out this measurement of cultural group differences disentangled from differences of media.

5. *Temporal errors.*

In order to measure the temporal error, the intervals between a friend's first interview and the same friend reinterviewing the same informant in the Triple Sample of 374 persons (Figure 3) were divided at the median into two equal plurels. The mean time interval for one group was 2.8 days

and for the other was 16 days. The average discrepancies between inter-
views were 32% and 24% respectively. This shows that the shorter the
interval of time between interviews the greater their discrepancy. Within
the limits explored here, longer intervals yield more similar replies. Our
interpretation of this unexpected finding is the "new conversation" hypothe-
sis. In an immediate reinterview the informant prefers to amplify and
qualify his previous answers rather than repeat them exactly, but after a
longer interval the details of his former conversation have faded more
and his replies will tend to repeat his basic answers. This means that, for
maximal reliability here, several weeks should elapse before a person is
reinterviewed.

For the plurel, the index of probability of goodness of fit of the find-
ings for the longer interval compared with the shorter interval shows that
the time interval makes no difference. Without exception on the questions
plotted the probability was .99, indicating almost complete identity between
the two interviews by the same friend, whether the interviews were half
a week or over two weeks apart. Similarly the probability of fit was .99 be-
tween the schedules filled out by a friend and by a stranger, regardless of
whether longer or shorter intervals between interviews were studied.

The conclusion about the time interval between interviews is, then,
that individual fluctuations exist and decrease with time, but so cancel
each other as to result in a stable distribution of answers for the plurel
whatever the time interval (within a month).

From all these measurements of the various dimensions of sociometric
reliability the summarizing findings were that plurel reliability was nearly
perfect (99%) under the conditions specified, while individual reliability
ranged from 81% at best to 75%. It was 81% when the interviewer error
alone varied out of the six classes of identified error, and it was 75% when
the temporal error alone varied with the other five classes of error held
constant.

6.   Residual errors.

There seems a residual core of individual error, amounting at most
to 19% of discrepancy here, which remains unanalyzed. Towards eliminat-
ing it by further analyses and experimental designs, two explanatory hy-
potheses were developed but only partly explored. One hypothesis was that
this residual error is partly due to the "new conversation" factor noted
above; the other hypothesis is that the residual error is partly due to
the fluctuant nature of some of the data. On some questions, peoples' re-
sponses are intrinsically superficial and fluctuating. Thus when asked, "How

often did you listen to program (or station) X in the last seven days?" an informant may reply in his first interview, "Oh, it's hard to say—perhaps two or three times"; and in his second interview, "I'm not just sure. I'd guess about twice in the last week, perhaps." The first answer is recorded as 2.5 times a week, the second as 2, and a discrepancy is marked up because of the shifting phrasing or slightly fluctuant opinion of the informant.

For the "new conversation" hypothesis further evidence was available. Most people in conversing prefer to say and hear some new remarks and not repeat the remarks they have just made. Even the bore—who is unusual—does not repeat himself verbatim. This tendency leads an informant in a reinterview to go on to new aspects of the questions about radio listening and not merely reiterate his former answers. In Arabic especially a conversation is enjoyed for its "sparkle," and interest in well-phrased sentences, and not merely for its expressing precise facts. Frequently the interviewers found this attitude in the informant explicit as when one informant, in answer to the question on reactions to performers on the air, remarked in the reinterview, "I told your companion here all about the speakers X and Y on the radio, so now I will tell you more about some of the other speakers whom I like." The resulting difference in recorded statements was counted as discrepancies by the technique used here. Further evidence for this hypothesis of a "new conversation" factor consists in the observed fact that the question which asked the informant, "Are there any performers on the air whom you especially like or dislike?" accounted for some 30% of the average discrepancy, although the number of its items on the average was only 10% of all items of answering. It was the question which gave the informant freer latitude than other specific questions (such as, "In what languages do you listen?") and therefore gave three times its due share of discrepancies on reinterviewing.

E. Conclusion

The answer to the methodological question, "How reliable are the surveys in war zones?" was that the reliability of the individual was imperfect, while the reliability of the plurel was nearly perfect. The reliability of the individual person's answers ranged from 63% to 90% depending on the variation in the informants, the interviewers, their interrelations, the schedule card and the time interval between surveys.

On most questions the answers of a plurel showed a 99% excellence of fit between a first survey and a second survey reobserving those answers. This high reliability held regardless of variation in informants, inter-

viewers, interrelation, or time interval; it held in both the Syrian radio poll and the Sicilian polls about the radio, shelter, clothing, food, public officials, and news dissemination. This high reliability of the surveys for the population as a whole was the important assurance the authorities needed before using the survey's findings in making administrative decisions.

THE GRAPHIC PRESENTATION OF SOCIOMETRIC DATA

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It is customary to present the results of sociometric testing by means of a diagram (called a sociogram) illustrating the choices given and received by various members of the group. The purpose of such a diagram is to provide a picture of the sociometric structure and thus enable an observer quickly to determine the status of any member of the group, to identify the leaders and the unaccepted, and to obtain some indication of the combinations, cliques, and cleavages into which the social unit may be subdivided.

As originally developed by Moreno,[1] the sociogram was of the form illustrated in Figure A. This diagram shows all the choices made by the sixteen pupils in a third-grade classroom. Each child had been asked to select two others as preferred companions at lunch. The children are identified by number; girls appear at the right side of the diagram, boys at the left. Mutually reciprocated choices are indicated by double-headed arrows with short cross-bars at the middle of the shaft. The arrangement of subjects on the diagram, while haphazard in part, is determined largely by trial and error with the aim of minimizing the number of intersecting lines.

Such a diagram has obvious advantages over a verbal or tabular means of presentation. In its general principles, it represents the prototype for all subsequent developments. In its specific form, however, it has certain limitations from the point of view of ready interpretation. A sociogram of this type is frequently confusing to the eye, and, in general, is ill-adapted for the analysis and comparison of sociometric structure. For example, in Figure A it is hardly apparent at first glance just who chooses whom, who are the stars and isolates, and what are the mutual choices, cliques, and cleavages that may be present in the structure. The data here depicted are for a comparatively small group. The confusing diagrams that may result in the case of larger groups are strikingly demonstrated in the figures appearing on pages 124-129 of Moreno's definitive monograph.[2]

Many of the above inadequacies are remedied in an adaptation of the sociogram developed by Northway.[3] This method, appropriately referred to

[1]Moreno, J. L. *Who Shall Survive?*, Obtainable at Beacon House, New York, N. Y., 1934.

[2]Moreno, J. L. *op. cit.*

[3]Northway, Mary L., "A Method for Depicting Social Relationships by Sociometric Testing," *Sociometry*, Vol. III, No. 2, April, 1940.
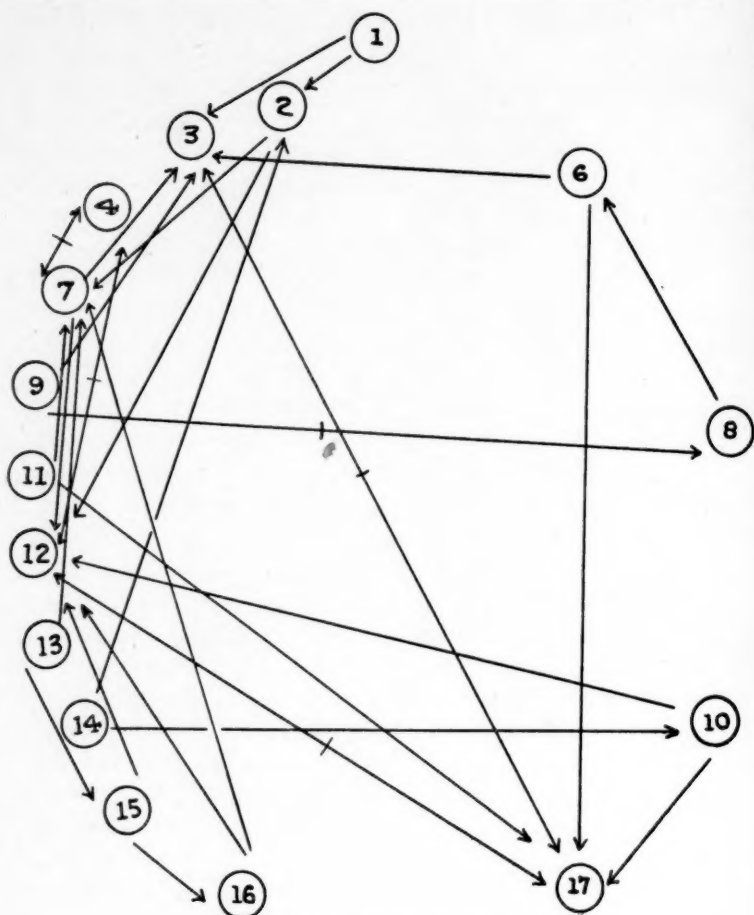
FIG. A.—SOCIOGRAM
for
a Third Grade

Criterion:
Luncheon preference

Girls   4
Boys   12
Total   16

as the "target technique," is described by Northway as follows:[4]

Four concentric circles whose radii increase are drawn by equal
steps. The acceptability scores (based on the total number of choices
received by each person) are divided into quartiles . . . The lowest
quartile is on the outside of the target and the highest in the middle.
Each subject is placed on the target in the quartile [sic] to which his

[4]Idem, page 148.

acceptability score belongs. The nearer he is to the center, the higher his score is.

It will be noted that since the quartile, like the percentile, is not an area but a point, Northway's use of the term is not strictly accurate. The term "quarter" is more appropriate and will be utilized in subsequent discussion when areas rather than points are being considered.

The advantages of Northway's method of presentation are best illustrated by an example. Figure B shows the data of Figure A presented
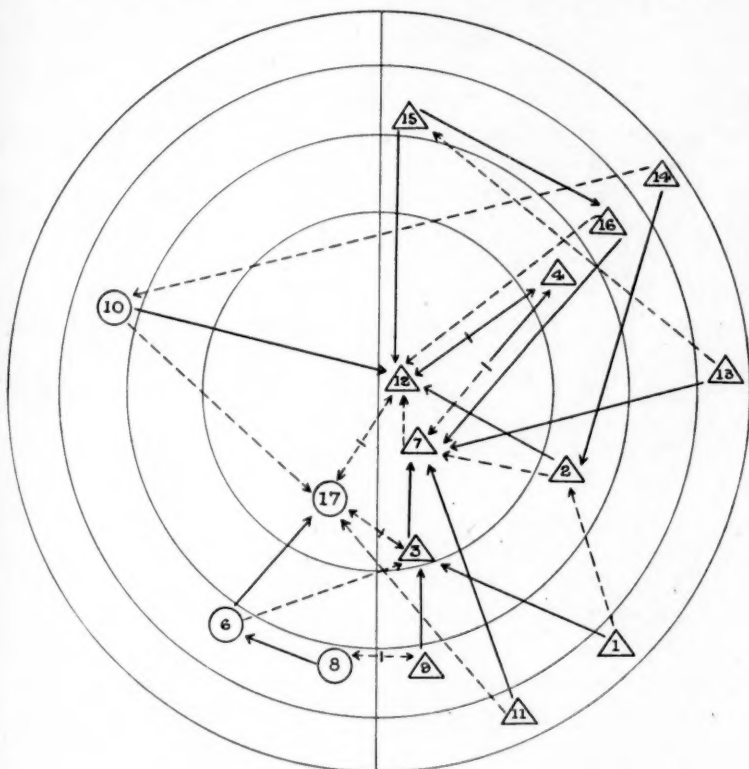
FIG. B.—SOCIOGRAM

For a Third Grade Group

Criterion:
Luncheon preference

Girls	4
Boys	12
Total	16

Mutual choices	5
Girls' choices of boys	5
Boys' choices of girls	5

Circle is divided into quarters.
Highest quarter (children chosen most often) is in center.
Lowest quarter (children chosen least often) is on the outside.

by means of the target technique. It will be observed that in Figure B the significant aspects of sociometric status are more quickly apparent. In particular, since the rank order of individuals is preserved, the stars in the center and the isolates on the periphery are immediately distinguishable.

The Northway technique is highly adaptable and permits advantageous additions and modifications. Some of these have been adopted in Figure B. Small circles and triangles (consistent with Moreno's usage) have been employed as differential symbols for girls and boys respectively and the target has been subdivided vertically so that inter-sex choices are readily apparent. A similar division may be utilized in the study of other cleavage groups. To provide an appropriate and consistent scale for drawing, the radii of successive circles have been adjusted so that the area of each division is equal to one-quarter that of the whole target. Solid and broken lines denote first and second choices respectively.

In more complex situations, where indicating all choices results in a chaotic diagram, various adjustments are possible. When selections are made on the basis of a single criterion, it is often convenient to show first choices only. In groups where several criteria are utilized simultaneously, the writer has found it practical to indicate only the constellations[5] of mutual choices (See Figure C). Using such a constellation diagram as a master sheet, one may prepare "case studies" by superimposing all selections made or received by a particular person or group of persons.

The quartile-target device as developed by Northway is quite satisfactory for the sociometric study of a single social group the membership of which remains reasonably constant. If, however, it is the investigator's purpose to compare the sociometric status of persons in a group or several groups varying in size, certain modifications become necessary. As has been pointed out elsewhere,[6] conventional statistical indices such as ranks and quartiles—as well as raw scores, percentiles, ratios, and standard scores —are not wholly acceptable as measures of comparative status in diverse sociometric situations. In view of this fact, Northway's procedure of dividing the target into quarters and arranging subjects in order of rank is not entirely suitable in most sociometric studies where several groups are involved or where the same group changes markedly in size over a period of time. In such situations it becomes necessary to utilize an index which

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[5] As here used, the term "constellation" denotes any continuous network of mutual choices.

[6] Bronfenbrenner, U., "A Constant Frame of Reference for Sociometric Research," *Sociometry*, Vol. VI, No. 4, November 1943.
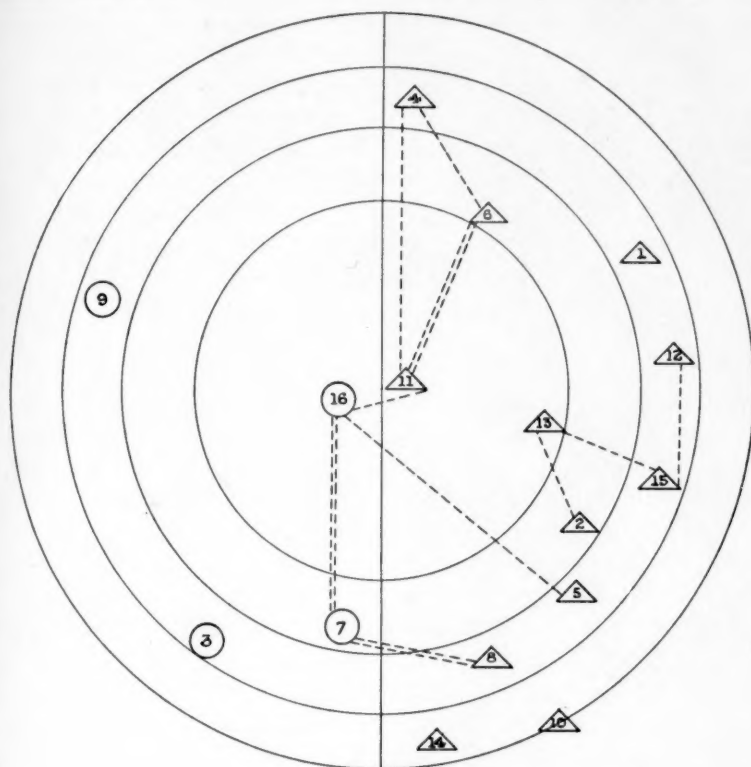
FIG. C.—SOCIOGRAM

Grade III

Criteria:
luncheon choice
schoolwork choice
movie choice

Girls	4
Boys	12
Total	16

Mutuals	13
Isolates	1

Chance likelihood of falling—

within innermost circle	.02 or less
within second circle	.50
outside second circle	.50
outside third circle	.02 or less

Broken lines show constellations of mutuals

Girl-boy choices (not shown) 11
Boy-girl choices (not shown) 16

has uniform significance regardless of the size of the group. Such an index has been developed by the writer through application of the concept of deviation from chance expectancy.[7] Utilization of this concept also permits the evaluation of statistical significance.[8] The index may be readily

[7]Bronfenbrenner, U., *op. cit.*
[8]*Idem*, pages 370-371.

incorporated in the target form of graphic presentation by fixing the divisions of the target so as to correspond with differential levels of chance expectancy. Figure C shows a sociogram constructed in accordance with the above principle. The figure is based on data from a sociometric test involving two choices with respect to each of three criteria—a total of six selections by each person in the group. Since to depict all of these choices would produce a hopelessly confusing diagram, only the constellations of mutual choice are shown. It will be noted that in Figure C the divisions of the target no longer set off successive quarters but instead delineate differential levels of chance selection. Thus children receiving a number of choices so great as to be statistically significant (*i.e.* occurring by chance only two or fewer times out of a hundred) are shown in the innermost circle, those nearest the center being the most frequently chosen. Moreno's term "star"[9] may legitimately be applied to persons within this area and the limit of statistical significance (.02) may be used for making the definition of stardom more rigorous and precise. Children receiving a number of choices so *small* as to be statistically significant (probability .02 or less) appear in the outermost ring of the target, with isolates shown on the extreme periphery. The second circle designates the 50 per cent or expected value, about which the majority of the subjects are clustered.

The principles and procedures involved in computing an index of sociometric status based on the concept of deviation from chance expectancy have been discussed in full elsewhere.[10] For the most common types of sociometric situations tables have been prepared giving the approximate raw score values corresponding to the 50 per cent level and to the positive and negative limits of statistical significance.[11] Through the use of these tables it is possible to read directly the raw score values to be assigned to each circular division on the target. Thus the amount of computation required for determining boundaries for a target sociogram of this type becomes even less than that involved in determining successive quartiles.

The fact that in sociometric tests persons are chosen so few or so many times as to yield statistically significant results points to the conclusion that factors other than chance must account for extreme positive and negative deviations in sociometric status. It appears both convenient and reasonable to proceed on the assumption that these factors are in the nature of components of social forces the resultant of which determines

[9]Moreno, J. L., *op. cit.* page 34.

[10]Bronfenbrenner, U., *op. cit.*

[11]Bronfenbrenner, U., "Experiment and Inference," *Sociometry*, Vol. VII, No. 1, February 1944, page 68.

the subject's position in the group.[12] It would follow from this hypothesis that the persons shown in the central and peripheral areas of the target are those most markedly affected by the social forces of preference and avoidance operative in the group. In this connection it is of interest to consider an analogy between the sociometric target and a revolving wheel. It will be recalled that for any rotating body there is a centrifugal force which tends to impel the object outward from the center of rotation. For the object to stay fixed in the orbit of revolution, the centrifugal force must be counter-balanced by an equal and opposite centripital force. If the latter force is not sufficiently great, the object will be ejected from the physical system. Similarly, if the sociometric target is thought of as revolving, social forces of attraction may be likened to centripital force, while forces of rejection may be compared to centrifugal force.[13] When the former are not sufficiently great, or when the latter are unduly strong, the subject will tend to move toward the periphery of the target. To carry the analogy further, isolates may be regarded as those who either because of neglect (*i.e.* lack of attraction between themselves and other members of the group) or rejection (active expulsion by one's companions) are being forced from the field.

It is thus fitting that they be represented on the rim of the target.[14] This analogy, however, should not be carried too far. First of all, it is not rigorous, inasmuch as in the one instance the focal point is a center of rotation whereas in the other it is the mean or expected value represented not by the dead center of the target but by a circle lying between that center and the outermost edge. Moreover, in a sociometric situation there is no real counterpart to a force derived from circular motion. Finally, it is always hazardous to draw comparisons between physical and social or psychological phenomena, for, with the latter, the "personal equation" instead of representing an almost negligible element of error, constitutes, in a broad sense, the principal function to be investigated.

[12]Moreno has used the term "tele" to describe the basic element presumably involved in such social forces; he defines tele as "the simplest unit of feeling transmitted from one individual to another" (Moreno, J. L., *op. cit.*, page 432).

[13]It is of interest to recall further that as both centrifugal and centripital force are determined by computing the second moment, so, in like manner, deviations from chance expectancy are also functions of the second moment (Bronfenbrenner, U., "A Constant Frame of Reference for Sociometric Research," *loc. cit.*, page 378). Indeed, the *sigma*, or standard deviation is a strict analogue of the physicist's radius of gyration.

[14]It is worthy of note that this last aspect of the analogy finds confirmation in clinical and experimental results even to the extent of anticipating the two-fold classification of isolates into "neglectees" and "rejectees," (See Bronfenbrenner, U., "Experiment and Inference," *loc. cit.*, footnote, page 71.).

CLIQUES IN A STUDENT BODY OF STABLE MEMBERSHIP

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Sociometric data were secured from 147 of the 148 students attending Gorham Normal School about a month before the close of the college year, 1943. From these data was observed a tendency for each student to make and/or receive a plurality of choices in one of 13 sub-groups, referred to hereafter as cliques. This is a report of relationships within and between cliques, and of relationships between clique membership and membership in some other plurel of the student body such as freshmen, sophomores, juniors, seniors, dormitory residents, commuters and popular persons.

All but six of those tested had been members of the student body during the eight months of the college year preceding the test. Of the six exceptions, five had attended the college the preceding two years and had rejoined the group about three months before the test after non-resident membership as student teachers for a semester. The sixth, a man, had no previous connection with the student body and had joined it only a month prior to the test. Eight women and 26 men who entered in the Fall had left before the test was made, five of the women holding a non-resident connection as student teachers. Otherwise there was stability of membership for the group. The degree of stability is deemed high.

TESTING PROCEDURE

Student interviewers, following a uniform procedure, presented a questionnaire to each person tested requesting responses to each of the following questions:

1. You now have no choice of whom you sit next to in chapel. If you could choose the two persons sitting next to you in chapel, what students now at Gorham would you choose?
2. If you were to teach in a community with five other students now at Gorham, whom would you choose?
3. What two students now at Gorham would you confide in?

The responder placed the completed questionnaire in an envelope on which her name was written and sealed the envelope. Assurance was given that responses would be kept confidential. The investigator was the only person knowing what responses an individual made.

Intrinsic motivation, required of the ideal test of this sort, was ab-

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sent from questions 1 and 3. It was present to a certain extent in Question 2, since a new system of cadet or apprentice teaching required groups of five or six students to teach in one community. It was later found that this was frequently kept in mind by freshmen and sophomores in responding to this question.

Interviewers were instructed not to insist on exactly two responses to Questions 1 and 3 or five responses to Question 2, but, if asked, to tell the responder to set down the names she wanted to, either more or fewer than the number asked for.

The average number of different persons chosen per capita on Question 2 was 4.88. On Questions 1 and 3 combined, 78.2 per cent of the responses duplicated responses to Question 2. This is submitted as evidence that, by and large, the choice of a person on Question 1 or Question 3 indicates much the same sort of behavior as the choice of a person on Question 2. (Taken separately, 75.8 per cent of responses to Question 1 and 78.4 per cent of responses to Question 3 duplicated responses to Question 2.) It was therefore decided to consider only the different persons chosen by an individual, making no distinction as to what question resulted in a choice or whether a person was chosen on one, two or three questions. The average number of different persons chosen per capita on all three questions combined was 5.69, only 16.8 per cent more than the average on Question 2 alone.

CLIQUE FORMATION SHOWN

Among the 837 choices considered there were 196 mutual pairs, representing 46.8 per cent of the choices. In attempting to discover clique formation, sociograms were first constructed using only the mutual choices. About a dozen fairly well filled out configurations of six to twelve persons were found, as well as four chains of three to seven persons, two isolated pairs and nine individuals without mutual choices, five of whom received no choices at all.

The 445 non-mutual choices were then filled in. Two groups which had seemed separate coalesced, three of the chains became groups, and individuals of doubtful status were found to consider themselves or to be considered, through non-mutual choices, in one of the groups. The rule was followed that a person be considered in the group in which she made and/or received a plurality of her choices, such a group having come into existence through the discovery of half a dozen or more individuals who made a plurality of their mutual choices among themselves. If an individual made and/or received an equal number of choices in two groups, mutual choices

outweighed non-mutual choices. One exception to the rule was a subject, CD, who made one mutual and one non-mutual choice in Group VIII and received four choices from Group XIII in which she made no choices. She was placed in Group VIII. A mutual triangle with one one-way choice missing was assigned to the group in which its three members made and/or received a plurality of their choices rather than by placing each member individually.

All but nine persons were placed in one or another of the 12 groups by rule. These nine included a mutual pair, a mutual chain of four and three individuals receiving zero, one and two choices. The six who had mutuals made their other choices in different groups. All were freshmen, but neither of the two major freshman cliques could claim any unless the mutual bonds were broken. The nine made 53 choices and received 20. Of the 20 received, 15 were received from each other. This was considered basis enough for considering them a separate clique rather than leaving them out as isolated from the clique organization of the community or assigning them individually to several groups in which their choices by no means clearly placed them.

This situation led to the question whether these persons had made their choices, earlier in the college year, in cliques which had rejected them and so had been thrown more and more together and were coming to choose each other. It suggested this hypothesis: In a closed community of stable membership, individuals rejected by those they at first choose, tend in time to choose each other.

If the membership of the student body had remained stable for an-

TABLE I

Group	No. of members	Mutuals in group	Mutuals out group	Choices made	Choices received	Index of Interaction
I	18	62	6	107	174	28.8
II	14	34	6	79	110	33.5
III	10	36	2	54	70	46.7
IV	7	18	4	39	48	50.0
V	14	30	4	81	83	24.7
VI	10	28	3	52	48	38.9
VII	17	28	7	97	82	21.0
VIII	12	32	4	74	58	32.6
IX	8	22	0	40	34	46.4
X	11	16	3	61	44	30.9
XI	8	14	3	46	32	41.1
XII	9	16	4	54	34	26.4
XIII	9	8	2	53	20	20.8
Totals	147	344	48	837	837	—

other six months would some of the non-mutual choices among these nine freshmen women have become mutual choices, and would new non-mutual choices have developed within the group?

Table I gives the number of members in each clique, the number of mutual choices made with clique members, the number of mutual choices made outside the clique, the total number of choices made and received by the clique, and the index of interaction. The index of interaction is obtained by dividing the number of choices made within the group by the total possible choices and expressing the result as a per cent. Thus in Group I the number of possible choices is $n^2 - n$ or $18 \times 18 - 18 = 306$. The members of Group I made 88 choices within their clique. Thus the index of interaction for the group is 88 divided by 306 or 28.8 per cent.

Columns 3 and 4 show how useful the plotting of the mutual choices was in identifying cliques at the beginning of the analysis. In no clique is the number of in-mutuals less than four times as great as the number of out-mutuals and 87.8 per cent of all mutuals were made within the clique. It is believed that the percentage of mutual choices made is higher than it would have been had the testing been done early in the college year.

The lowest indices of interaction are 20.8 and 21.0 in Groups XIII and VII respectively. Are these high enough to indicate a significant departure from chance? If the choices were made at random, the number received within a group from its own members would be given by the formula: $\frac{n-1}{N-1}m$ where n is the membership of the clique, N is the membership of the whole group tested, and m is the number of choices made by members of the clique. Dividing this by the number of possible choices within each group would give the index of interaction based on chance choosing. This would be found to be approximately 4.0 for each of the cliques. Deviation from 4.0 occurs when the number of per capita choices made by a clique varies from the mean. In the case of Group XIII, its index of interaction is 5.0 times the index of interaction based on random choosing, and in the case of Group VII, 4.8 times. Ratios are greater than this for all other cliques. From this it is concluded that the tendency of clique members to make choices within the clique is significantly greater than chance.

Table II gives the number and percentage of in-group choices made by each clique and the per capita choices made and received.

The cliques are numbered in order of per capita choices received, or "popularity." The cliques varied little in per capita choices made but

TABLE II

Group	In-Group choices made	Per cent of In-group choices made	Per capita choices made	Per capita choices received
I	88	82.2	5.9	9.7
II	61	77.2	5.6	7.9
III	42	77.8	5.4	7.0
IV	21	53.8	5.6	6.9
V	45	55.6	5.8	5.9
VI	35	67.3	5.2	4.8
VII	57	58.8	5.7	4.8
VIII	43	58.1	6.2	4.8
IX	24	60.0	5.0	4.3
X	34	55.7	5.5	4.0
XI	23	50.0	5.8	4.0
XII	19	35.2	6.0	3.8
XIII	15	28.3	5.9	2.2
Mean	38.8	58.3	5.7	5.4
Sigma		15.1	0.32	1.94
Mid-score	35.0	58.1	5.7	4.8

showed considerable variation in popularity. The sigma for the popularity series was more than six times the sigma for the friendliness series.

Only Group IX varied more than two sigma from the mean in friendliness. The deviation was negative. This clique was the only one which made no mutual choices outside the clique. It was composed of eight commuting juniors, seven of whom lived in Portland, ten miles away. This status as commuters is suggested as an explanation of the significant variation in the number of choices they made per capita. Their status as juniors suggests that continued membership in the college for nearly three years did not foster in these off-campus students as wide a range of close acquaintanceship as it did among dormitory residents.

Group VI, making the second lowest number of choices per capita, was composed of 10 commuting students all living 10 miles or more from the campus.

Group I, which had dominant influence in the student body as will be indicated in Table III, was the only clique to show a deviation of more than two sigma from the mean of choices received. This was a positive deviation.

INTER-RELATIONS BETWEEN CLIQUES

Table III presents the proportion of choices made by members of each clique in their own clique and in each out-group. If each clique had made an equal number of choices in itself and in each other clique, the per-

TABLE III

Group	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	82.2	x	—	—	x	x	x	—	x	x	x	x	—
II	x	77.2	—	x	x	—	—	x	—	x	x	x	x
III	x	x	77.8	x	x	x	—	x	—	—	—	—	—
IV	7.7	10.3	x	53.8	x	—	7.7	x	x	—	7.7	x	—
V	18.5	8.6	x	x	55.6	x	x	x	x	x	—	x	x
VI	9.6	—	9.6	—	x	67.3	x	—	x	—	—	—	—
VII	15.5	x	—	x	12.4	x	58.8	x	—	—	—	x	—
VIII	x	8.1	10.8	x	x	—	x	58.1	—	x	—	x	—
IX	15.0	—	—	x	x	—	10.0	—	60.0	—	x	—	—
X	23.0	x	x	x	x	x	x	x	x	55.7	—	—	—
XI	x	13.0	x	x	x	x	x	—	x	x	50.0	x	—
XII	22.2	16.7	x	x	x	—	9.3	—	—	x	x	35.2	x
XIII	17.0	x	17.0	9.4	x	x	x	11.3	—	—	—	x	28.3

centage of choices made would be approximately 7.7 in each cell of the table. Figures showing percentage of choices made by each row group in each column group are given when they are equal to or greater than 7.7. Percentages less than 7.7 but greater than zero are indicated by an x. Zero choices are indicated by —. The figure 7.7 dividing indicators of stronger and weaker channels of influence is arbitrary. The substitution of x for the smaller percentages is believed to aid the reader summarizing the relationships.

With mean in-group choices per clique of about 58 per cent, the expected out-group percentage, if out-group choices were made equally in all out-groups, would be 3.5. In a majority of the cliques this would mean only two choices per out-group. For this reason it is here preferred to consider any number of choices up to the arbitrary 7.7 per cent as indicating a normal condition in a community showing clique formation as found, and to consider 7.7 per cent or more out-group choices in any group as in-indicating noteworthy or extraordinary conditions.

The index of out-group choices is zero in 52 of the 156 cells of out-group choices, exactly one-third. The index is x in 81 cells and it is 7.7 per cent or higher in 23 cells.

Reading across the rows to summarize choices made it is found that the three most popular cliques made normal out-group choices in eight, eight and six other cliques, but made no high index choices. The two least popular cliques show high indices in three and four out-groups. Seven cliques between the three most popular and the two least popular show high indices in one or two out-groups. A general tendency for the number of out groups in which high index choices are made to vary inversely with the popularity of the group choosing is noted. The exception is Group IV,

making the borderline 7.7 per cent of its choices in three outgroups, and 10.3 per cent in another. This discrepancy might be explained as a statistical accident. Group IV is, however, unique in that its membership is based on locality of home town rather than on college class or dormitory residence.

Perhaps the most striking fact observable from Table III is that no index higher than 7.7 is shown above the main diagonal. This means that with the two exceptions of Group IV no clique made a high proportion of out-group choices in a clique less popular than itself.

The area above the main diagonal, indicating choices made in a less popular clique, is found to have only two of the 23 high indices, 39 of the 81 normal or x indices, and 37 of the 52 zero indices. A comparison of reciprocal relationships within the 78 pairs of out-groups reveals that in only 5.1 per cent of the cases has a clique made a higher proportion of choices in a less popular clique than it received from that clique. The exceptions are the 7.7 indices, marginal, made by Group IV in Groups VII and XI, which made a normal proportion (3.1 and 4.3 per cent respectively) in Group IV; Group VI making 3.8 per cent in Group IX from which it received no choices; and Group VIII making 4.0 per cent in Group XII from which it received no choices.

The 78 reciprocal relationships are: Mutual isolation, or mutual zero indices, 13; mutual x indices, 23; high indices in more popular cliques from which x indices are received, 14; high indices in more popular cliques from which zero indices are received, 7; x indices in more popular cliques from which zero indices are received, 17; zero indices in a more popular clique from which x indices are received, 2; and x indices in a more popular clique from which high indices are received, 2.

In 48.7 per cent of the cases a higher proportion of choices was made in a more popular clique than was received from it. In 46.2 per cent of the cases the reciprocal indices were the same. And in 5.1 per cent of the cases a lower proportion of choices was made in a more popular clique than was received from it.

Two-way isolation was found in 16.7 per cent of the cases, one-way isolation in 33.3 per cent of the cases and reciprocal choosing in only 50 per cent of the pairs.

The seven most popular cliques received one or more choices from a mean of 9.9 out-groups. The six least popular received one or more choices from a mean of 5.8 out-groups, roughly one-half.

Group I alone received a high proportion of choices from half or more

of the out-groups and Groups I and V alone received one or more choices from every out-group.

An interpretation of the tendency for the higher of two reciprocal indices to be made by a less popular clique in a more popular one will be made after considering the question of leadership.

LEADERSHIP

The number of choices received by each of the 147 individuals tested ranged from zero to 27, with a mean of 5.7 and a sigma of 4.2. An individual receiving 10 or more choices would deviate more than one sigma from the mean. An individual receiving 15 or more choices would deviate more than two sigma from the mean. Such a person will be referred to as very popular, while a person receiving 10-14 choices will be referred to as popular.

There were were five very popular persons: two in Group I, two in Group II and one in Group V. There were 14 popular persons: four in Group I, three in Group II, two in Group VII, and one each in Groups III-VI and VIII. The most popular member of each of the five least popular groups, Groups IX-XIII inclusive, received, respectively, 8, 8, 8, 7 and 5 choices. The most popular person was in Group I and the second most popular person was in Group II. Some tendency is seen for the popularity of a clique to vary directly with the popularity of its most popular member. The rank-order coefficient of correlation for this relationship is .9166 plus or minus .2764.

Let us consider the individuals in three categories: very popular, popular, and others, and compare the influence of each on members of their own clique with influence on those outside the clique. The five very popular individuals received 42 choices from clique members and 63 from outsiders. The 14 popular persons received 88 choices from clique members and 70 from outsiders. The 128 others received 360 choices from clique members and 197 from outsiders. In terms of average number of choices received by a person in each category we have: very popular, 8.4 from clique, 12.6 from outsiders; popular, 6.3 from clique, 5.0 from outsiders; others, 2.9 from clique, 1.5 from outsiders; very popular and popular combined, 6.8 from clique, 7.0 from outsiders. The 19 persons deviating plus one sigma or more from the mean in choices received tended to receive an equal number of choices per capita from clique members and outsiders. The 128 others tended to receive about twice as many choices per capita from clique members as from outsiders. Choices from clique members averaged

2.34 times as many per capita for the 19 as for the others, but choices from outsiders averaged 4.67 times as many per capita for the 19 as for the others.

This finding, together with the fact that group popularity varied with the popularity of a group's most popular member, will explain, in part, the tendency noted in Table III for cliques to make a higher proportion of their out-group choices in a more popular clique than they received from it.

It will be assumed that the 19 most popular persons exercised a certain amount of leadership, and, since no "powerful" person was observed—*i.e.* a person whose relatively few choices received came from popular persons— this group of 19 will be spoken of as the leadership group of the student body. Strictly speaking, it is those most admired, chiefly as co-workers.

What are the connections within this leadership group? Among the five very popular persons there are no mutual choices. One of the two very popular persons in Group II makes a non-mutual choice of the other.

Among the 14 popular persons there are mutual choices between the two in Group VII, between a pair in Group I and between two pairs in Group II. There are four non-mutual choices of a person of the same clique and seven non-mutual choices of an outsider. Six very popular persons have mutual choices with popular clique mates. Two very popular persons have mutual choices with popular outsiders. One very popular person makes a non-mutual choice of a popular outsider.

The index of interaction of the leadership group is 10.8 since members make 37 of 342 possible choices of each other. Of these, 25 are choices of clique mates and 12 of outsiders, a fact which may largely explain the index of interaction 2.7 times that resulting from random choosing. (It is recalled that the smallest ratio of any clique index to the random index was 4.8.)

The leaders, then, receiving about as many choices from outsiders as from clique mates when the community as a whole is considered, receive only half as many choices from outsiders as from clique mates in the leadership group alone.

The picture, then, is of channels of influence existing between 65 of the 78 pairs of cliques, with attraction in only one direction — virtually always toward the more popular clique — in 26 of these channels and flowing both ways in 39 of them. But the stronger current, when there is reciprocal attraction, virtually always flows toward the more popular clique. Twelve of these channels converge on Group I, which has six of the 19

members of the leadership group including the most popular leader. A strong current of attraction flows toward Group I from a majority of the other groups and a normal (or x) current from the rest. There is also such a convergence on Group V, which has a very popular member and a popular member, but towards this clique the attraction is of normal, or x, strength in all but one case. Ten channels converge on Group II, with two very popular members and three popular members, and in half of these channels the current of attraction to the clique is strong, in the other half of x strength. As we proceed toward the less popular cliques, we find the channels of influence fewer and the currents of attraction, when they exist, are more frequently of x strength. Only three channels of influence converge on Group XIII and the current of attraction toward this clique is only of x strength in all three. Likewise as we proceed toward the less popular cliques we find fewer members of the leadership group in a clique. We also find that the clique's most popular members received fewer and fewer choices until in Group XIII the most popular member received only five choices, a fraction under the mean for the whole student body.

If the six members of the leadership group who are in Group I were agreed on a program they could doubtless gain support of the other 12 members of their clique. There are then strong currents of attraction toward these 18 Group I members from eight cliques which include all but 44 of the remaining members of the student body. If the six members of the leadership group in Groups II and III were opposed to the program, they could presumably swing the 24 members of their cliques and also the 27 members of Groups IV, VIII and XI where their influence outweighs that of Group I. They could theoretically gain half of the members of Groups VI, XII and XIII where their influence is about equal to that of Group I. This would give them 65 votes to 82 for the Group I party, a respectable minority though made up chiefly of freshmen and sophomores. If the 12 members of the leadership group in the three most popular cliques should agree on a program before opposition crystallized, their cliques combined have strong currents of attraction from all the other 10 cliques, and so the program would seem to be assured of being carried.

CLIQUES AND OTHER PLURELS

Relationship of class and clique membership is: 63.6 per cent of the seniors in one clique (VII); 68.3 per cent of the juniors in two cliques (I and IX); 65.2 per cent of the sophomores in three cliques (II, XI and

XII); and 78.9 per cent of the freshmen in three cliques (III, VIII and XIII); 69.3 per cent of all persons in one of the nine cliques in which members of one class were predominant. The mixed cliques were Group IV, based on location of home town, its members coming from a section of the State farther away than a majority of students lived, Group X, made up of the ten men and the fiancee of one of them; Group VI, made up of commuters from urban areas; and Group V, possibly based in part on proximity of residence in a dormitory.

There is also a distinct division of cliques into those made up of dormitory residents and those made up of commuters. There are four dormitory cliques without commuters, two with only one commuter, and one with two commuters in a total of 18 members. There are three commuter cliques without dormitory members. The three mixed cliques are Group X, men; Group VII, the seniors, where class membership apparently overcame social distance associated with different residence status; and Group XIII.

Comparison of Table IV with Table III will show whether class mem-

TABLE IV

An Analysis of the Cliques as to Class Membership and Residence

Group	Freshmen	Sophomores	Juniors	Seniors	Dormitory	Commute
I	0	4	13	1	16	2
II	0	14	0	0	13	1
III	9	1	0	0	10	0
IV	3	3	1	0	7	0
V	2	1	7	4	13	1
VI	2	3	5	0	0	10
VII	0	0	3	14	11	6
VIII	12	0	0	0	11	1
IX	0	0	8	0	0	8
X (men)	1	4	3	3	4	7
XI	0	8	0	0	0	8
XII	0	8	1	0	9	0
XIII	9	0	0	0	7	2
Totals	38	46	41	22	101	46

bership or residence status is associated with out-group choices made by the cliques. Group VII, with a majority of the seniors, had an index of 12.4 per cent of its choices made in Group V, headed by a person believed to have been the class leader the previous year, and an index of 15.5 in Group I. It received high proportions of choices from Group IV (mixed), Group IX, junior; and Group XII, sophomore.

The dominant junior group made only the normal proportion of choices

in the lesser junior group (IX) but received the highest proportion of out-group choices made by Group IX.

The dominant sophomore clique, Group II, made only a normal proportion of choices in the lesser sophomore cliques, XI and XII, but received the only high proportion of out-group choices made by Group XI and a high proportion from Group XII (16.7). Indices of Groups XI and XII in each other were x.

The dominant freshman clique, Group III, made normal choices in Group VIII but none in Group XIII. These lesser freshman cliques made their highest proportion of out-group choices in Group III. Group VIII made none in Group XIII, but Group XIII made a high proportion in Group VIII.

Some tendency is seen for the lesser groups of a class to favor the dominant group of the class in their choices, but the reciprocal tendency is absent.

Of the six possible indices of outgroup choices between the commuter groups VI, IX and XI, four were x and two were zero.

Of the 30 possible indices of out-group choices between the domitory groups I, II, III, IV, VIII and XII, six were high, 18 were x and six were zero.

The tendency for out-group choices among cliques to vary with residence status is thus seen to be absent in the nine residence cliques taken as a whole. Any such tendency which might be detected in the dormitory groups is of doubtful significance.

THE MALE MINORITY

The position of the 10 men in the student body is of interest. The last peacetime male population of the college was 106. It has been noted that 26 men had left during the year prior to the test. Normal connections of the group remaining had been broken and new ties had not been formed. This was the only unstable sector of an otherwise stable community.

There were, among the men, three seniors, three juniors, three sophomores and one freshman. Four lived in a dormitory; seven did not. Three had been members of one fraternity, six of another and one of no fraternity.

Considering mutual choices only, we find a chain of six members of one fraternity, and two members of the chain each had a mutual choice with a member of the rival fraternity. Two of the men were left out of the mutual pattern. Two men had mutual choices with their fiancees, one of whom was a popular member of Group I. The other had a mutual choice

with a girl in Group VIII, but neither made nor received any other choice in that clique. The girl did, however, make one and receive three non-mutuals in the clique of men, indicating her membership in it. One other person, a man, had a mutual choice with a Group I member.

Of the 38 non-mutual choices made by the 10 men, 15 were of men, 23 of women. Of the 19 non-mutual choices received, 15 were from men, four from women.

The fact that three of the men were presidents of their classes is, perhaps, an indication that the questions of the test were not well designed to reveal hetero-sexual choices. It must be remembered that the elections took place when there were 36 men in the student body and recent custom had been to choose a man for class president. Elections the following year, with six men in a student body of about 170, resulted in a choice of four women as class presidents.

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SOME FACTORS IN FRIENDSHIP SELECTIONS OF HIGH SCHOOL STUDENTS

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In its study of the amount and quality of human relationships that exist, of the cohesiveness of groups, of leadership-followership, and similar phenomena, sociometry has made many important contributions and has revealed the way in which to develop a science of such relationships and activities. It is fully as important, however, to discover the factors in the various attractions and repulsions that exist or occur among people. In the present instance attention will be confined to the unilateral attraction relationship of the friendship selection, which, in the immediate data to be discussed, may be defined as the listing on a questionnaire of the name of a fellow student considered to be a friend. However, the discussion should be thought of in relation to the whole problem of describing, measuring and interpreting human interrelations.

The subjects included in the study to be reviewed[1] consisted of the 103 members of the senior class of the Abilene, Kansas (1940 population 5,885) High School of the school year 1938-39. Each subject was given a questionnaire at the beginning of the second semester on which was to be listed the names of three friends, in addition to various items of collateral information, including sex, place of residence, church preference, athletic school activities, non-athletic school activities, non-religious community activities, father's occupation, father's community activities, and mother's community activities. Information on father's occupation and credit rating was also obtained from the local credit association.

The general approach employed in the study consisted of classifying the friendship selections in such a way that the subjects selected as friends by subjects having the same characteristics could be separated from those selected by subjects differing from them. Thus, the selections that were in-category in character[2] were separated from those that were out-category

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[1] The source of all data presented was Endacott, J. E., "An Analysis of Friendship Selections and Other Social Relations and Activities of 103 Seniors in a Kansas High School," Unpublished Master of Arts Thesis, University of Kansas, 1942.

[2] In-category selections are those made by subjects having the same general quality of a characteristic. The term in-category is preferable to "group" because of the important psychological distinction between a *unit* made up of individuals conditioned to each other and a *total* of individuals having the same characteristics not due to conditioning. In the use of "group" for "any plural number of objects, attributes or people" some otherwise careful thinkers prove themselves guilty of lack of clarity.

in nature. For example, if the total subjects were classified by sex, it would be possible to determine if girls tended to be selected as friends by girls more than by boys, and boys by boys more than by girls. This approach in effect implies that friendship selection is being studied essentially in terms of the relative importance of similarity and dissimilarity of selected friends to those who select them. If in-category selections surpass out-category selections, the general inference must be that friendship selections are influenced by the selector's own characteristics. Such a conclusion will possibly appear too obvious to justify the effort expended in the collection and classification of such data. However, the method makes it possible not only to check on this general factor of ego-centric motivation or evaluation in friendship selection,[3] but it also provides for the comparison of each item with every other in regard to the importance of in-category selection. For example, in-category selection is more pronounced for sex than for place of residence, we may conclude that sex is a more important factor than residence for accounting for friendship selections. And all other items may be similarly compared.

Table I presents the number and percentage of choices by people of the

TABLE I
NUMBER AND PERCENTAGE OF CHOICES AS FRIENDS BY SUBJECTS OF SAME AND DIFFERENT SEX CATEGORY

| Category | Number in Category | Total Choices by Others | Category Choices | | | |
| | | | Same | | Different | |
			Number	Per cent	Number	Per cent
Male	49	89	74	83.1	15	16.9
Female	54	132	115	87.1	17	12.9
Total	103	221	189	85.5	32	14.5

same sex. A total of 85.5 per cent of the selections were in-category in character, leaving only 14.5 per cent out-category choices. This high percentage of in-category choice clearly shows the importance of the factor of sex in choice of friends. The data indicate that at the senior high school level the segregation of the sexes, so far as friendship selection is concerned, is very nearly complete.

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[3]Another possible explanation of some in-category selection may be more attractive to some social scientists, although for most characteristics it cannot be the correct interpretation. For some characteristics friends may have developed because of past associations, and the past associations may have been responsible for the similarity, due to mutual adjustments of people. But association is not responsible for some forms of similarity. Religious preference could be an example of similarity resulting from common experiences; sex could not.

However, if the strength of the sex factor in choice of friends, relative to the strength of other factors is to be clear, some common standard of expected selection of friends, provided only chance factors are operative, must be employed. Instead of merely using the percentages of 85.5 and 14.5 in the above-mentioned illustration, the percentages of in-category or out-category choices must be related to the expected percentage of such choices, if chance factors alone were operative.

When first confronted with this problem it might appear correct to conclude that the expected percentage of in-category choice would be equivalent to $\dfrac{100}{n}$, with n representing the number of categories. In other words, 2 categories would yield 50.0 per cent in-category expectancy, 3 categories would yield 33.3 per cent, 4 categories would yield 25.0 per cent, etc. But this could be true only where each category contained the same number of subjects as each other category, a very rare occurrence in unselected populations. In order to obtain an accurate standard of chance expectancy of percentage of in-category choice, the following formula was developed:

$$ I = \frac{C_1(C_1-1) + C_2(C_2-1) + C_3(C_3-1) + \ldots C_s(C_s-1)}{n(n-1)} $$

in which I represents the proportion of expected in-category choices to expected total choices; C_1, C_2, C_3, . . . C_s represent categories of the total population; and n represents the total subjects under consideration.[4] When the appropriate data from Table I are substituted in the formula the result is $I = \dfrac{49 \times 48 + 54 \times 53}{103 \times 102} = 49.6$. This percentage of expected in-category choices divided into the observed percentage of in-category choices (85.5) yields a simple ratio of 1.72 : 1.00. In comparison, the ratio of percentage of out-category choices (14.5) to expected percentage of out-category choices (50.4) was .29. When the in-category ratio is divided by the out-category ratio, an index of in-category preference of 5.93 is obtained. Such a ratio indicates a very strong tendency for high school friendship selections to be within the same sex group rather than within the other sex group. If the index of in-category preference proves to surpass that for other characteristics beside sex, sex may be inferred to be a more important factor in friendship selection than the other characteristics, and by a degree relative to the difference between the ratios.

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[4] For a fuller discussion of this formula see Smith, Mapheus, "A Procedure for Determining Expectancy of In-Category Selection," *Sociometry*, 1943, Volume VI; 68-71.

The same sort of analysis is applicable to each of the single characteristics of the subjects of the study, so long as the categories formed by the analysis of each characteristic are mutually exclusive. But the procedure described will not serve for the analysis of people who may belong to more than one category in the same analysis. For example, since the same student may participate in more than one non-athletic school activity, analysis cannot be made by mutually exclusive categories for the characteristic of non-athletic school activities. Had each subject been restricted to naming a favorite activity, in which he participated, analysis could be made for each specific activity separately, as was possible for religious preference, sex, residence, grade in American History, father's credit rating and father's occupational level. But in cases of multiple associations of the subject or his father or mother in the same characteristic, all that could be done was to form numerical categories of a mutually exclusive kind for each separate characteristic, by classifying subjects according to the number of associations. This was done for non-athletic school activities, athletic school activities, non-religious community activities, father's community activities and mother's community activities. Such a method of analysis is not entirely satisfactory, but reveals the importance of *amount* of various kinds of association for friendship selections.

Table II contains the results of the quantitative analysis of all of the separate kinds of information obtained on the subjects of the study. In every instance except number of athletic school activities of subjects the percentage of observed in-category choices surpassed the percentage of expected in-category choices, and in this instance the difference was small, as indicated by an in-category ratio of .97 and an index of in-category preference of .95. The sex factor (in-category preference index of 5.93) was more important than any other, followed by church preference (1.84), father's credit rating (1.72), residence (1.55), and father's occupational status (1.48). The lowest figure, aside from number of athletic school activities, was for number of father's community activities (1.22). The ratio for number of non-athletic school activities (1.26) was surpassed by number of non-religious community activities (1.45) and grade in American History (1.32), but passed the ratio for number of mother's community activities (1.25) by a small amount.

The data summarized in Table II provide the first, and, in a sense, most important result of this study. This is a set of comparative values for characteristics associated with friendship selection. These ratios were entirely unpredictable in size, and it is safe to conclude that superiority of

TABLE II

FACTORS IN FRIENDSHIP CHOICE EXPRESSED AS RATIOS BETWEEN INDICES OF OBSERVED AN EXPECTED IN-CATEGORY CHOICE*

Category	Observed Percentages of Choices, by Categories		Expected Percentage of In-Category Choices	Ratio of Observed In-Category to Expected In-Category Choice	Ratio of Observed Out-Category to Expected Out-Category Choice	Index of In-Category Preference
	Same	Different				
Sex	85.5	14.5	49.6	1.72	.29	5.93
Residence	67.9	32.1	57.5	1.18	.76	1.55
No. Non-Athletic School Activities	29.4	70.6	24.9	1.18	.94	1.26
No. Athletic School Activities	39.4	60.6	40.6	.97	1.02	.95
American History Grade	37.1	62.9	30.9	1.20	.91	1.32
Church Preference	22.2	77.8	13.4	1.66	.90	1.84
No. Non-Religious Community Activities	55.7	44.3	46.6	1.20	.83	1.45
Father's Credit Rating	29.4	70.6	19.5	1.51	.88	1.72
Father's Occupational Status	19.5	80.5	14.0	1.39	.94	1.48
No. Father's Community Activities	31.7	68.3	27.5	1.15	.94	1.22
No. Mother's Community Activities	36.2	63.8	31.2	1.16	.93	1.25

*Although it is not necessary to present the two or more tables for the complete analys of each characteristic summarized here, a description of the categories and the number (subjects in each may be of value to those desiring to use the same procedure.

Residence 2 categories: rural (31), urban (72). Rural defined as below 2,500 populatior

Number of non-athletic school activities: 5 categories: no activity (11), 1 or 2 activitic (32), 3 or 4 activities (35), 5 or 6 activities (17), 7 or more activities (8).

Number of athletic school activities: 4 categories: none (59), 1 (14), 2 (26), 3 or more (4

Grades in American History: 6 categories: A (9), B (16), C (51), D (20), F (3), Witl drawn (4).

Church preference: 13 categories: Baptist (13), Brethren-in-Christ (4), Roman Cathol (9), Christian (10), Episcopal (3), Evangelical (5), Grace Reformed (1), Lutheran (9 Methodist (28), Presbyterian (15), United Brethren (1), Wesleyan Methodist (1), none (4).

Number of non-religious community activities: 3 categories: none (62), 1 (33), 2 (8).

Father's credit rating: 8 categories: Pays cash (7), Prompt pay, financially responsibl (8), Prompt (37), Safe, slow Pay (16), Slow, troublesome to collect (12), Risky (15), Deman cash (6), none (2).

Father's occupational Status: 9 categories: Professional (dentist, lawyer, minister, mus cian) (5), Business executive (operator of flour mill, manufacturing, radio executive, telephor official) (6), Business sales (auto, cleaning, electric supplies, florist, furniture, insurance, mont ment works, nurseryman, salesman, theatre owner) (17), Clerical (accountant, bill clerk, post clerk, rural mail carrier) (4), Skilled (mechanic, carpenter, electrician, painter, paper-hange plumber, printer) (12), Semi-skilled (barber, bookbinder, farm machine mechanic, miller, plas ter's helper, truck driver) (13), Unskilled (attendant, janitor, laborer, odd jobs) (24), Far owner and operator (17), Deceased (5).

Number of father's community activities: 6 categories: none (44), 1 (26), 2 (18), 3 (11 4 (4), Deceased (5).

Number of mother's community activities: 6 categories: none (39), 1 (41), 2 (9), 3 (9 4 (2), Deceased (3).

observed in-category choices to expected in-category choices could not have been predicted for most of the items, on the basis of the knowledge possessed prior to the analysis. Even now the interpretation of the ratios so as to account for their relative size can only be made in hypothetical terms which must eventually be evaluated in the light of further studies aimed at eliminating erroneous hypotheses. However, something is to be gained from a brief analysis.

The evidence suggests that a general theory of friendship selection should take into consideration certain major features of societal structure. For example, the sex cleavage of society in the adolescent years is clearly very important in friendship selection, although this cleavage is not complete. Observation and personal experience reveal that children and adolescents are encouraged to form their friendship attachments among persons of their own sex. Even adults generally think of friendship relations as being more suitable when within the limits of the sex group than when they cut across sex lines. These facts appear adequate to explain the importance of sex as revealed in this body of data.

Similar arguments undoubtedly apply to other items in the table. Religion is the subject of fairly clear cleavages in almost all of the United States, even when it is denominational rather than sectarian in character. Although its influence on friendship selection was not as strong as that of sex, it had considerable weight. In the community in question it may have been believed that closest friendships should be supported by common religious preferences and participation. And it is probable that actual association in religious activities was an important factor in some of the choices.

Economic and occupational structuring in the community also seem to have been quite important. The usual tendency of adults to associate with people on the basis of wealth and general occupational class appears here as a characteristic of high school pupils, doubtless indirectly because of the general tendencies for social groupings to accord with the economic and occupational hierarchies.

There is a little *a priori* reason to suppose that school grades in a single subject would be an indication of the trend of friendship selection. The relationship is small but observed choices exceed chance expectancy enough to deserve comment. If detailed examination is made of the selections, it is seen that only two of the three subjects receiving a grade of F in the course were selected as friends and these by students in other grade categories, while none of the four pupils who withdrew were chosen, probably because they were no longer intimate enough with the other sub-

jects to be given much attention. Accordingly, the A,B,C and D in-category choices were further above chance expectancy than was true of the whole group. It thus appears that choice as friends was affected by factors related to success in the history course. A possible interpretation of the results is that friendship choices, the habit of studying together and the tendency to obtain similar grades are mutually and causally related. The latter two should be related to some extent, but the data required to test this hypothesis were not collected, with the result that it cannot be evaluated for the particular group of subjects.

Little that is worth while can be said about the other characteristics investigated. Because of the necessity of confining the analysis to number of activities of athletic, non-athletic, non-religious community, father's community and mother's community nature, little of a significant nature may be expected. Thus from personal observation it is known that most members of athletic teams are on very friendly terms and that team athletic experiences tend to produce strong friendships. Yet number of athletic activities was the only item found not to be a factor in friendship choices. However, since the general trend of the analyses for number of activities of subjects and their parents indicates in-category choices superior to chance, we may conclude that the amount of association, whatever the kinds of activities, so long as they involve generally accommodative or cooperative activities, are factors in friendship selections. In more personal terms, this means that those subjects who participated in several activities would tend to be associated with others who participated in such activities. Participation together would be expected to lead to mutual friendship choices. Those who did not participate in such activities would probably not be selected as friends by so many others, which fact would also help to account for the ratios discovered. The role of number of parental activities is also fairly clear. Thus, if a subject's father were a member of many civic clubs, he would probably be friendly with men who also participated in such activities. And whole families might be expected to be affected by the fathers' relationships. The mothers' associations would have a similar effect on their adolescent children, especially in the modern American "democratic family."

This study of friendship selection also makes several contributions of a more far-reaching character than those indicated. As was mentioned in the beginning of this report, the analysis by in-category choices provides us with a general conclusion that friendship choices either are or are not a reflection of the characteristics of the chooser. When observed in-category choices surpass expected in-category choices, as was true of the high school subjects, the implication is that people select as friends other people whom

they resemble in one or more characteristics. In the present study the selection extends this principle to several kinds of separate characteristics, as well as to the number of each of several classes of activities engaged in. As a general principle we may therefore suggest that friendship choices are somewhat ego-centric, or more properly *ego-morphic* in character, that is to say, of such a nature that the person selected to some extent reflects the character or form of the selector. In turn, this may mean that friendship selection is merely a form of ego-expansion, of adding to one's ego by extending its limits to embrace other people having the same general characteristics. Such an interpretation is not surprising to many sociologists and psychologists, but that the characteristics which are involved in the ego-expansion are of such a general and even impersonal nature adds worthwhile details to our knowledge.

The conclusion concerning the self-reflective nature of the friendship selection raises a question which can only be answered by further research. It is desirable to learn whether the similarity between those who name friends and those they name has developed as a result of association which may have changed the characteristics of the participants, or whether the selection grew out of recognition of characteristics already in existence before the association began. Friendship choices, are obviously understood to rest on friendly interaction, but it is just as obvious that the friendly interaction may gradually shape some characteristics while it cannot affect others. Sex is one of the latter characteristics, while religion may be one of the former, and number of activities is clearly an example of the former. We therefore should expect to determine by research in just what way each "factor" operates in friendship selection, or whether it is only a correlate and without contributive significance.

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CHANGING THE STRUCTURE OF A TENTH GRADE CLASS
A Sociometric Research Project

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This is a two-year study of a tenth grade class in a small suburban community. Our purposes were four:

1) to stratify this group of 40 odd boys and girls into three status (or class) levels by use of the Warner community study technic;
2) to establish by sociometric test the original friendship structure of the group and to appraise its stability and change over a four month interval;
3) to initiate during the successive semesters of the second year, a program of: a) individual guidance and counseling, and b) sociological group management technics, computing the changes in each instance in a) selected individuals, b) the overall group pattern, and c) group substructures such as cliques, and
4) to draw such inferences as seem tenable regarding success and failure in "democratizing" the structure of comparable classroom groups.

Pending complete analysis of our data, we are reluctant to discuss findings in anything other than a general and tentative sense. Among our clearest impressions are these:

1) the stability over time of the original group structure,
2) the persistence, in spite of all that we were able to do, of a small tightly integrated clique,
3) the relative ineffectiveness of individual guidance technics in changing group structure,
4) the moderate effectiveness of group management processes even under rather ideal classroom conditions, and
5) the general, or theoretical, unclarity in regard to the teacher role in either of the above situations.

A CASE OF PARANOIA TREATED THROUGH PSYCHODRAMA

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INTRODUCTION*

The treatment of psychoses has been a challenge to the ingenuity of the psychiatrist ever since psychiatry became a special branch of medicine. The lack of any rationale must be laid to the absence of a consistent scientific theory of the origin of psychosis. It is the aim of this paper to introduce the psychodramatic concept of psychosis by presenting a case of paranoia.

The milieu is a psychodramatic sanitarium, a mental hospital built around a theatre as its chief therapeutic tool. The architectural setting exemplifies the new principle. The theatre for the psychodrama is not in a special building, it is an extension of the main house itself. This arrangement is a symbolic duplication of the basic, perennial psychological background of man. He is divided from early childhood on by the dimensions of reality and fantasy. Once this division has emerged in him, he never succeeds in breaching it. But in his social behavior he acts as if a breach between fantasy and reality has never taken place, or as if the two were fully integrated. He tries to give the world around him the illusion, if not of perfection, at least of individual unity.

The Search For "John"

The family of Mary, a girl of 23, applied for her admission to the sanitarium. It was with this very request that the dilemma began. Her two sisters explained that Mary would never come voluntarily. Three years ago she had met a young man, a certain John, at a Christmas party. She had been with him a few minutes, and never spoke of him until she became ill. She never saw him again, except as an apparition. She had fallen ill with influenza when John returned to her mind. Immediately after her recovery she began searching for John. She sought for information concerning his address, she made trips to the village in which he supposedly lived. She entered strange houses in which she hoped to find him, all in vain. Finally she was brought home by the police. Mary was sent to one mental hospital

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after another. She was non-cooperative, ran away persistently trying to find John, wandering from óne place to another. Repeated interviews with members of the family enabled me to piece together Mary's psychological history.

The problem was to start a therapeutic relationship to Mary. The first step had to be carefully planned, as it would determine the entire course of treatment. She did not consider herself sick, but reacted with physical violence to the efforts of her family to talk John out of her mind. After a preliminary conference with members of my staff a plan of strategy was made up. I advised the family to change its attitude towards Mary, to cooperate in her search for John, and to bring her news, a few days later, that they had found an old friend of John's, whose home in Beacon, New York, John had recently visited. Mary thereupon started immediately for the sanitarium. After a short token resistance her sisters agreed to accompany her.

I started the treatment by putting myself and the staff in a difficult position. My working hypothesis, based on Mary's psychological history, was as follows: John had never existed. Even if he did, Mary knew little of his real person. What she knew of him was largely the product of her own imagination. The claim that John was in Beacon was not entirely a deception; he could be there as well as anywhere else. In addition, I had a method, the psychodrama, by means of which I could produce John.

First Interview

Everything worked according to plan. When Mary arrived she entered my office and as anticipated, reversed the technique of psychiatric interview. "I'm Mary, are you Dr. M?—Where is John?" Here I seemed to be trapped. But according to "plan" there was a Western Union telegram on my desk: "Have to appear before the draftboard tomorrow will come within two days" signed "John." I passed the telegram to her. Mary read it and said: "Isn't it wonderful?" Her sisters smiled in unison. This won us two days to work out a situaticn. According to plan I introduced Mary to a "friend of John's," an auxiliary ego, William, and to Jane, a "friend of John's mother." Mary feverishly asked questions about John and his family, looked at the telegram again somewhat suspiciously, then asked for John's address. We had expected this question and had the address ready. According to plan, William suggested that she write a letter to John immediately, announcing her arrival in Beacon, and to tell him not to delay his coming.

A correspondence developed between Mary and John which, from the point of view of an outsider looked fictitious. Psychodramatically speaking, there was nothing fictitious about it. The auxiliary ego assigned to the task

of being a good friend of John's helped her at one time to write her own letter to John, and also to receive the kind of letter she expected from him. This was accomplished by a subtle interviewing of what she wanted John to write her. By this two-way technique William succeeded to be an auxiliary ego to both Mary and John. John was a fictitious person to us, but to Mary he was real. The task of the auxiliary ego was to identify himself with Mary to such a degree that he knew what she wanted, and to suggest moves in advance of her own request. This increased her faith in the reality of her fiction and in our honesty.

THEORY OF PROCEDURE

The theory of procedure I had established so far was as follows: Let us begin the treatment with a support of Mary's efforts, using a procedure called *psychodramatic realization technique*—John exists, he loves Mary as much as she loves him. We opened wide the door which *could* lead to realization, but did not assist her to attain *actual* gratification. On the contrary, we began at once with methodical, *gradual interpolation of resistance, or gradual removal of resistance* as Mary required from situation to situation. By the correspondence we had established a relationship to a fictitious John in order to give her a means of communication with the real John. The real John was hard to produce, but the fictitious John was completely under our control. We could have him drafted or fall in love with someone else. We could influence Mary via the correspondence. We could stop the correspondence at will. Finally, we could let John die. From the point of view of a control experiment this procedure was ideal. John was like a character in a drama, directed entirely by us. Such fictitious persons are often necessary in the process of *therapeutic confirmation* of the psychotic world. This confirmation of a delusion or hallucination is of course highly experimental. The problem was: how soon will Mary begin to doubt? As we postponed John's arrival continuously, always by new detours, we worked ourselves out of one dilemma, only to get into a new one. It seemed like a chain of dilemmas without end. One thing cannot be emphasized enough, Mary wanted the real thing, John. There was no *as if* involved, at least *not for her*. It was we who were pretending, consciously and deliberately. She had a "transference" relation to John, not to us. To her we were a means to an end. We built an auxiliary world around her where she hoped to live as in a fairy-tale with her prince charming.

Period of Realization

Organization of a Psychodramatic Session

In general, a patient undergoes one or more interviews until a leitmotif is tapped which promises to be a suitable nucleus for a psychodramatic session. All patients are brought to the theatre first as spectators. Their reactions to the total situation and to the events on the stage are carefully watched. There are several versions of psychodramatic procedure. 1) A session can be designed to treat a single individual. The director and his staff of auxiliary egos plan the session on the basis of the history and the patient's present situation. The preparation of the subject consists in conferences with him leading up to a key situation, and continuous notation of all events concerning and utterances by the subject, from hour to hour. The nurses and auxiliary egos operate as participant observers. The reports are finally given to the psychodramatic director. As a rule, full spontaneity of expression is permitted to the subject. He does not rehearse in advance, his actions and role-takings emerge on the spur of the moment. As the director has his own plan of the session, however, the patient's spontaneity is often guided. The therapeutic value lies in *action catharsis* and, following the director's analysis, in post-action catharsis. 2) A session can be so designed that the individual treated does not act himself, but is a spectator sitting in the audience; his own problem is portrayed on the stage by a double, a professional auxiliary ego. The therapeutic value here comes from spectator catharsis. The planning of the stage action can be as highly organized as the subject requires it. It can be entirely spontaneous, or it can be rehearsed like a theatrical production. As the subject is not taking part, it is his spontaneity as a spectator upon which the therapeutic effect is based. 3) In yet another version it is not a single individual, but a large number of patients who are treated at the same time. The audience of patients is so organized that they have the same mental syndrome in common. The production on the stage is then planned by the director with professional auxiliary egos portraying the mental syndrome in a series of key-situations. The therapeutic effect is expected from spectator catharsis. In this version the psychodramatic presentation on the stage results in group psychotherapy for the audience. 4) In a similar version such a psychodramatic production is filmed. The chief task is then in the selective grouping of mental patients who may draw the greatest benefit from seeing one or another psychodramatic film. Obviously, a poorly selected film can be harmful.

First Session

Mary presented a special problem. There are types of patients who need highly individualized treatment. It is often dangerous to take patients of her type prematurely into the theatre and without *adequate motivation*. Motivation is individually determined and in Mary's case play-acting or "pretending" would have been out of tune with her intentions. Mary was prepared by a letter from John. He wrote: "William can tell you much about my people; I want you to like them." According to plan we took Mary into the theatre soon after she received the letter, to put a scene on for her, showing her how John's people lived. She sat in as a spectator, watching William acting in the role of John's father and Jane as John's mother. But Mary interrupted them to show us how John had acted when she met him. We had anticipated that her meeting with John would be psychodramatized and had prepared ourselves carefully for this possibility. She chose William to represent John but when it came to actual production she presented three versions of the meeting, indicating her uncertainty of what actually occurred. In the first version she met him at a Christmas party. She saw him there only at a distance in a group, but did not speak to him. In the second version she met him in a drugstore and had a talk with him. In the third version she saw a man and she knew he was John, although she did not see his face, but only his back and profile. William's portrayal of John was sharply criticized by Mary. His voice was too high and effeminate. His posture was not like John's. He, John, would never have come as close to her, he knew how to treat a lady. The conversation was not spiritual enough. "There was a strong flow of feeling between him and me. He never spoke a word. Right now I feel him. I know where he is and he knows where I am." At this point the director suggested that she herself should take the part of John. She did and gave us a portrayal of her experience—the real voice of John, how he walked, what he said and how he said it. It made us think of Hamlet if Shakespeare would have met the actual prince and had asked him to take the role of the ghost of his father. As we experimented with the three versions, it became evident that she had never seen John's face in full view, only his profile and back, at a distance of about 7 to 8 feet. But she had heard his voice in the absence of his body, and spoke to him when in fever from a grippe. She felt his presence many times in the past three years. Walking through Main Street "on the stage" she knew that John was in a red automobile, riding by. She received orders to expect him and to wait for him at a moving picture house at 7 p. m. As Mary portrayed John, the auxiliary ego William attempted to

imitate her enactment of John step by step, under her guidance. Many situations were dedicated to this task until she was satisfied.

This session did not end with an "analysis." Mary was not interested in analysis, either of herself or of anyone else. She was interested in action, in meeting John as rapidly as possible. And so the session ended with a "future" projection of John's arrival. It is good psychodrama not to end a session with a "letdown" for the patient, but with a high point.

There are certain types of patients whose production on the stage can be analyzed after every scene, in their presence. The analysis offers two gains, one for the patient's better understanding of his own problem, the other giving clues to the next logical psychodramatic situation to be worked out on the stage. But there are patients like Mary who would not accept analysis because they do not accept treatment. Indeed, they would resent it and run away from the situation. In such cases, all analysis, if any, has to be carried out on the level of the patient's delusionary life-constructions. The analysis which the psychiatrist has in mind for his own orientation has to be postponed until after the session, and must be carried out in the absence of the patient.

Second Session

This session was requested by Mary. She stepped up on the stage and said: "I received a letter from John, saying: 'There is one person I would like to meet—that is your father.' I have the feeling that John must be in the house somewhere, in one of the rooms on the top floor. He may be here in the audience." She looked at William and said: "You take the part of John. I wish my father were here, but he is dead. He passed away when I was five and a half. Would you take the part of my father?" she asked a physician in the audience.

She tried to help the doctor to enact the role of her father, but she hardly remembered the way he moved around, how he spoke, how he looked. She accepted the portrayal which the doctor gave of her father uncritically, although according to information received from other sources, it was incorrect. The situation occurred at the time of her father's death.

Then she dramatized the various personages of her cultural atom, and it became evident that the lineage of "Johns," male and female, went back into her early childhood. Our query, "Who was the first John and how was he conceived?" remained only partly answered.

Our conclusion was that she had a deep memory and clear vision of the products of her own imagination, such as John and kindred experiences,

but a poor memory and a weak attachment to people she had actually met or lived with. The portrayals of her mother and sisters given in later sessions were weak and inaccurate. She had always lived along two tracks of experience, but the world of imagination prevailed and pushed the world of actual events into the background.

Third Session

Mary's anxiety was growing, John was drafted and the day of reunion was constantly deferred. When she heard over the radio that many soldiers were married by proxy, she wrote to John, suggesting a proxy wedding. He wrote back a cheerful letter and named William as his substitute. A wedding ceremony was given, according to plan, in the therapeutic theatre. Mary was a beautiful and tearful bride. She kissed William, promising him eternal loyalty. Thus Mary and John became man and wife.

Mary and John stepped down from the balcony, the level of the messiahs and supermen, as the melody of the wedding march was sung, then from the lower levels of the stage into the audience. The outstanding thing about the wedding was the absolute realization-value it had for Mary. She was married to John from then on, the climax of her relation to John was reached. The days following the session her anxiety about the coming of John decreased. It seemed as if the wedding had been the beginning of a gradual detachment from John and a new period in her psychotic development.

Interpretation

The psychodramatic treatment of Mary can be divided into three phases: 1) the period of realization, 2) the period of replacement, and 3) the period of clarification.

In the realization period a world was constructed around her in which she and her delusions could live an abundant life. It was filled with characters and personages like John, his father and mother, and the "reborn" Mary. These characters were not inventions of the director and his staff, but products of Mary's imagination, however incomplete and blurred at times. She was the inspiring genius of the auxiliary world around her. She was blocked in the actual world in finding them and became ill. In the beginning we consciously and systematically exaggerated her symptoms, delusions and visions. We assumed that organizing her ideas and channelizing her emotions would benefit her in finding herself and discovering her own salvation.

Mary acted at times as if she had cut off the emotional strings with which she was attached to real persons, and tried to attach these strings to imagined persons. But these imagined persons did not respond to her, they had no spontaneity like real people. In a desperate attempt at realization she began to play *their* parts too. In the theatre for the psychodrama actors are engaged to play the parts of these imagined persons. Not ordinary actors, they were able to guide Mary where she would have failed alone. But the psychodrama was so planned that the *new* Mary found that John, his mother and father, were not easy people to get along with. It was as much a struggle as in the old world, but it was at least a struggle in adjustment to persons whom she loved and wanted. The home she wanted to have with John gradually emerged on the stage.

In this period of realization her normal social setting was replaced by a setting of her own design. The old Mary was replaced by the new Mary. The old house was replaced by a new house. Mother, sisters and others were brushed aside. New characters emerged: John and his predecessors, father of John, mother and friends of John, her dead father, her whole cultural atom, portrayed by auxiliary egos under her direction. Not that Mary's previous, normal setting was entirely abandoned. It was temporarily pushed into the background, but now and then portions crept into other characters and scenes. From time to time her mother and sisters appeared on the stage to console her when she was depressed or anxious. However, in this period her search for John prevailed and if she attempted to run away, it was solely to find him. She did not want to go home, or to run away to it. A significant phenomenon took place during the stagings of the realization scenes. She became dependent upon the auxiliary egos because they were the people who gave flesh to her Johns and other delusionary experiences. They became like parts of herself. That is one of the genuine functions of an auxiliary ego, to free a subject from that extreme form of isolation— hallucination. As she became attached to the egos in the psychodramatic world, her attachment tended to continue after a session. If Mary met the man who played John on the psychodrama stage an hour later in the dining room, and his behavior did not conform with John's, she would be angry with him. If it did conform, she would like him. Mary would react to William in a positive way as long as he wore the "mask" of John. As soon as the mask came off, she shifted to the person facing her. She had no attachment to William as a person, but only in the role of John. But on the psychodrama stage, in the course of action, some part of William crept into some part of John and began to be accepted by Mary as of

John. The mask of John changed gradually, taking on William's features. Before Mary knew it, John changed to a new John. He was really William, but she did not realize it. Now when she met William in the dining room after sessions, he acted like John with a changed mask. The auxiliary ego was then able to exercise, via this reversal of role-taking, a growing influence over Mary. And with this gradual process we leave the period of realization and enter the period of replacement.

PERIOD OF REPLACEMENT

First Session

Mary had become attached to William more than would seem permissible for a married woman. She asked him repeatedly whether he was married and if not, whether he would contemplate marriage. She invited him for walks and picture shows. The time had come to let John die. The *shift* from John, the hallucinated lover, to William, the auxiliary ego lover, was definitely established. John's death would give an official imprint to her freedom. An impasse had been reached which the psychodrama could end. William, although not a serious pretender to Mary's affections, was at least an actual person, and in addition, employed as a therapeutic agent. Although John's death would increase Mary's aggression, William appeared to be a good exchange. Accordingly, a session took place in the theatre, during which the formal announcement of John's death was made. Mary went into hysterics, insisted on mourning for John and was unapproachable for weeks.

In this new period, the treatment techniques had to be altered. As the mask of John changed, the masks of John's parents were bound to change. They took the form of William's mother and father. The mask of Mary herself turned into a different Mary, Mary number 3. The scenes on the stage took the following character: An auxiliary ego portrayed various versions of Mary, who was a spectator looking at herself. As the mask of Mary number 2 had lost some of its firmness, chances could be taken in mirroring Mary, how she acted in the sanitarium when she was excited and unreasonable, or how she used to be when she lived with her mother and sisters, before she knew John, as Mary number 1. We took a still greater risk—we let the auxiliary ego Jane, who portrayed Mary, meet real people on the stage in actual situations, while simultaneously she pretended to see the apparition of John, to hear his voice. Jane talked back to him, all the while acting as if she knew that it was an apparition she saw, that the voice she heard was not real. The auxiliary ego was told in front of Mary,

to keep the unreal clearly apart from the real without letting the unreal happening upset her or influence her behavior in real situations. In the period of replacement a shift was attempted from the hallucinatory world in which Mary lived to the actual people and atmosphere of the sanitarium. Although the replacement was incomplete, hanging mid-air, as it often does, between the hallucino-dramatic and the sanitarium setting, it brought Mary back to clashes with actual people. The auxiliary egos on the psychodrama stage turned out to be helpers in actual life situations. The therapeutic process was based on tele relations largely, as the transference of Mary towards the therapist was scattered and unstable. But although her relationship to any single person was unstable, she developed some degree of stability toward the total group. She found with some portion of her ego anchorage in one, with another portion, anchorage in another person. The total distribution balanced the stable and unstable parts and opened up opportunities for guidance. These attachments were a fusion of tele and transference factors, the tele factor increasing in strength as the patient recovered. Gradually Mary became ready to enter the period of clarification.

PERIOD OF CLARIFICATION

First Session

The climax of the treatment came when I confronted Mary, in the presence of her sisters and members of the staff, with the first *particle* of the truth. She was given a small dose. Just as we developed her auxiliary world first in small, then in larger doses, the procedure was now reversed. We reduced that world gradually by small doses first, contemplating greater revelations later on. Her relationship to William and other members of the staff was soundly established and we re-enacted before her eyes a scene depicting her arrival at the sanitarium. John was shown as alive and a friend of William's and myself, but he *refused* to come to meet Mary because he hardly knew her. Only under great pressure he conceded to start the correspondence with Mary. In the midst of this act Mary jumped up and tried to hit me. This brought about an upheaval, her own sisters and the staff members coming to my defense. Mary finally apologized for her misdemeanor. This was followed by a series of sessions, each breaking up more and more of the fictitious foundation upon which our treatment had been based.

Final Session

According to plan, a young man who was attracted to Mary and had

given her persistent attention before she fell ill, was invited to take part in her psychodramatic work. A *shift* of her affections from William to him began to take place. In his role-taking he was easily divided into reality and fantasy-playing and was a witty co-respondent to both parts in Mary, her self-component and the John-component. The circle of treatment was closing up. The shift from a hallucinated character, John, to an auxiliary ego, William, was the first step. The later shift, from an auxiliary ego to an individual in the community whom Mary had found and chosen herself was the second step. Around this new inter-personal nucleus her future began to take practical form on the stage, showing the return to her family and to employment.

Mary left the sanitarium soon after this session. Her interest in the auxiliary ego gradually faded out. She still lives in two dramatis personae, but one does not hamper the other, and she has found a partner whose two dramatis personae complement hers fairly well.

SUMMARY

There are five possible hypotheses of Mary's conception of John and his development.

First hypothesis: John is an actual person she has met and with whom she fell in love. This hypothesis is not acceptable. She saw only his back and profile and never made his acquaintance.

Second hypothesis: John is a forgotten man whom she has met in the past and who made an impression upon her. The psychodramatic material offers no confirmation of this.

Third hypothesis: John is her own father. He was the first man who made an impression upon her. His death deepened it. In order to test this hypothesis all possible father-versions were portrayed on the stage by auxiliary egos and by Mary herself. In addition, all other characters of her cultural atom, her mother and mother-substitutes, brothers and sisters, her boyfriends and lover-substitutes, her co-workers and neighbors, they all came to expression. The conclusion was reached that the father relation could not account for the production of John.

Fourth hypothesis: John is Mary. This hypothesis finds somewhat more support than the three previous hypotheses, but is still not sufficient to make the John-production understandable. John has many features akin to Mary. He acts often like her double, he is often like a part of her. But how can Mary be a man? The psychoanalyst would probably explain this by ascribing it to Mary's unconscious wish to be a man. But there is not sufficient evidence for such a conversion of Mary having taken place.

Fifth hypothesis: John is a creation of Mary's, an "immaculate" conception. For this hypothesis there is sufficient evidence. The manner in which Mary produced John reminds one of the way a mother gives birth to a child, and an artist creates his work. The biological offspring and the creative offspring are parallels. The two chains of events—conception, pregnancy and birth on one hand—and meeting of John, latency period and the hallucinated emergence of John on the other, offer significant points of comparison. But there is no cause-effect relationship between them. The assumption that one is the origin of the other, that a "displacement" of the John-process takes place, from the reproductive and genital level to the creative and fantasy level, via a process of sublimation, may be favored by those who still uphold Freud's libido hypothesis. It is unfounded. The development of infantile spontaneity, the early breach between fantasy and reality experience in the child, the sociometric evolution of grouping, give to a spontaneity theory of the origin of psychosis a greater amount of probability.

The external stimuli have often no direct bearing upon the work of an artist. It would be difficult to show the relationship between anything in Beethoven's life and the musical structure of the ninth symphony, although relationships exist. Similarly, the real John, if he existed, or Mary's father, were rather accidental in the production of John, the precipitating causes at best, not the main causes.

Mary is like a dramatist who wants to write a play with a historical subject-matter. But there are some differences between her and a regular dramatist. She does not write anything. It is as if she wants to write and produce the drama at the same time. But a closer analysis reveals that she wants to produce it without writing it. She is also very different from a producer who would try to produce a play without writing it. He would try to get a cast of actors, and would transfer to them the plot and characters he has in mind. They may then, as in an impromptu play, produce a significant piece of work. But Mary, besides being the dramatist and producer, wants also to be the plot, and all the characters within it. Although she is not aware of it, she wants to play all the parts. A producer selects a locality or an architect to build a theatre, for the presentation of his work. But Mary is anxious to be the architect herself and to transform the entire universe into a theatre. She is determined to stage her John-production wherever she is. She suffers from a *realization paranoia*.

Some of the religious prophets and saints have manifested an insatiable will at self-realization, with an urge to stage their drama everywhere. They

too, are dramatists, auto-dramatists. Mary is a confused auto-dramatist. Here is perhaps an answer to the question why transference is, during a psychotic attack, weak and unstable, or vanishes entirely. Mary, like many psychotics, tries to do things which only a god can do, create new beings. She, like god, had her days of creation—and she created John. A god has a unique relationship to his world and its creatures. He is identical with them. He does not need any transference to operate between him and his subjects. They are in a literal sense, part of him. He does not need to identify himself with any particular subject of his universe.

We have described elsewhere that the factor which controls the *objective* relations within a social situation is tele and that transference must be considered as a subjective and psycho-pathological outgrowth of it. In this context, a world bereft of its transference relations does not fall to pieces, it falls back on its tele structure, its primary anchorage. When Mary stepped out of a world of transferences and identifications, she did not fall into a void, but the tele gave her, so to speak, a lift.

But as we saw, Mary was not able to find that which she had created. She lacked the spontaneity and creativity—the source of mental catharsis—necessary for the successful completion of her dramatic search. A normally productive dramatist who has finished his play pushes it aside, thus making room for a new idea. After the delivery he is free from the pangs of birth. But poor Mary had all the pangs of birth without delivery; it was like a pregnancy without end. Mary needed helpers, auxiliary egos. These she found at the theatre for the psychodrama.

INDEX OF TECHNIQUES USED

Period of Realization

1) Technique of self-presentation. Mary presents herself, *her* mother, *her* father, *her* sister, *her* minister, *her* employer, *her* lover John, and so forth.

2) Technique of collective role-presentation. Mary portrays *the* mother, *the* father, *the* sister, *the* lover.

3) Therapeutic soliloqui technique. The portraying, by side-dialogues and side-actions, hidden thoughts and feelings, parallel with overt thoughts and overt actions.

4) Mirror technique. Mary sits in the audience, sees herself portrayed on the stage by an auxiliary ego.

5) Psychodrama of dreams. Mary, after verbal telling of a dream,

tries to reproduce the atmosphere of the dream upon the stage, action, gestures, words, colors. Dream characters are represented by auxiliary egos.

6) Analytic psychodrama. An analytic hypothesis, for instance, the Oedipus complex, is tested out on the stage in order to verify its validity. Mary takes the role of her mother in a situation with her father, (coming home, fired from his job because of a heart ailment). The analyst sits in the audience and watches. Analysis of the material is made immediately after the scene.

7) Hallucinatory psychodrama. Mary puts her delusions and hallucinations to a stage test.

8) Hypno-drama. Mary resists acting with William as the John-substitute on the stage. The director, assuming a technique of heightened authority and aggression towards the subject, orders Mary step by step what to do. Mary follows directions as if under the influence of hypnotic suggestion.

9) Projection of the "future." Mary presents on the stage her life situation ten years hence.

10) Control tests. The subject is placed opposite three persons portraying John, three persons portraying her father, three persons portraying her mother, and other characters, always in the same situation. The productions are compared as to overlappings and deviations. The aim is to determine the nucleus of facts remaining constant.

Period of Replacement

1) Planned psychodrama. Mary is a spectator, William and two auxiliary egos portray his own family on the stage. The purpose of this technique is to test the possibility of John being replaced by an actual person.

2) Symbolic psychodrama. In a symbolic plot Mary is ordered to take the role of a princess who dreams of an unreal lover.

3) Projection technique. Like Hamlet, Mary invites her family to a play. The show she puts on is she and John united on the psychodrama stage.

4) Reversal technique. Mary is on the stage with several doubles of herself. Each portrays another part of Mary. One auxiliary ego acts Mary as she is now, Mary acts herself soon after her father's death, the other auxiliary ego how she may be thirty years hence. The masks of Mary are simultaneously present and act in sequence, one continuing where the other left off. Another form of this technique is to let Mary and her double act in the same situation, for instance, both meeting John.

Period of Clarification

1) Indirect action technique. The subject is treated via *another* person to whom she is strongly attached, fiance, mother, sister.

2) Direct action technique. The subject presents herself, her actual problems to the therapist, which are then treated by interviews or on the stage.

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BOOK REVIEW

Gallup, George, *A Guide to Public Opinion Polls*, Princeton University Press, 1944, pp. 80, $1.50.

If you have ever wondered just what a Gallup Poll is and how it operates this little book will be your meat. It has all the answers. As a matter of fact, the presentation is in question and answer form. The eighty questions are classified under the following headings:

> The Function of Public Opinion Polls
> Size of the Sample
> The Cross-Section
> The Problem of Questions
> Interviewers and Interviewing Problems
> Polling Accuracy
> Election Predictions
> Interpretation and Reporting of Results
> Significance of Public Opinion Poll Results
> Polling and the Process of Democracy
> Measurement of the Intensity of Opinion and
> Miscellaneous Problems of Public Opinion

For the most part the questions are searching and the answers are straightforward and convincing. It is a fact that public opinion polling rests upon a firm scientific basis of sampling and statistical probability. When it comes to the wording of questions, possible interviewer bias, and the interpretation of results the polls are on less firm ground. However, Gallup does not omit questions on these points and his answers to them are honest in pointing out the limitations and instructive in indicating how the integrity of polling may be safeguarded. Although admittedly a partisan book in that Gallup obviously favors polling, none of the common criticisms are evaded. The answers are informative and reasonable.

On only one point do I find any extreme statement in the book. This is on the subject of the "band wagon effect." Gallup has always maintained that there is no such thing as a band wagon effect in politics—that is people show no tendency to want to vote for the winner. He says, "The band wagon theory is one of the oldest delusions of politics . . . in recent years no objective evidence has been found to support the contention that poll predictions influence voters."[1] There is in press a study[2] of the 1940 political campaign in Erie County, Ohio, which offers evidence for the

existence of a band wagon effect. In this study a representative sample of people was interviewed seven times between May and the week after election. Those who in May had a definite opinion regarding the outcome of the election but who had not made up their minds were interviewed after the election and it was discovered that they tended to vote for the candidate which they had expected to win. Some admitted that they wanted to vote for the winner, and a few mentioned the public opinion polls as a source of information upon which they based their expectations as to which candidate would win. Gallup is right in claiming that poll predictions are not an important or major factor in election results but to deny the possibility of a small band wagon effect is to assume the unreasonable position that public opinion polls alone in this world have no influence.

The above point is, however, a minor difference of opinion and in no way diminishes this reviewer's hearty recommendation of the book. It is clearly and simply written and is the quickest and easiest possible way for anyone to become informed about the operation of a technique which not only is destined to stay with us but which may come to implement and vitalize our democracy more than we now think possible.

RUTH A. INGLIS
Commission on the Freedom of the Press
New York City

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[1] P. 81.

[2] Lazarsfeld, Paul F., Berelson, Bernard, and Gaudet, Hazel, *The People's Choice*, American Council on Public Affairs, 1944.

ANNOUNCEMENTS

American Sociometric Association, Formation Proposed

For some time, persons interested in sociometry and allied fields of work have inquired about the possibility of organizing a sociometric society. To explore the extent of this interest a committee was appointed by the Sociometric Institute. This committee sent a circular letter to a group of 112 individuals. A gratifying response was received from over half those reached.

It is evident that a real need exists for such an organization. The committee plans to report to those who, before November 20th, have expressed an interest in participating in the formation of such a society.

Inquiries should be addressed to Mrs. Maria Rogers, Chairman, Temporary Committee, Box 56, Beacon, N. Y.

Rural Settlement Institute

Henrik F. Infield has taken leave of absence from the Rural Settlement Institute and has joined the overseas service of the Office of War Information. In his absence the business of the R.S.I. will be conducted by Mita Infield of Vassar College.

Books Received

Pitirim A. Sorokin, "Man and Society in Calamity," E. P. Dutton & Co., Inc., New York, 1943; Adolph A. Sandin, "Social and Emotional Adjustments of Regularly Promoted and Non-Promoted Pupils," Bureau of Publications, Teachers College, Columbia University, New York, 1944; Henry J. Otto, "Elementary School Organization and Administration," D. Appleton-Century Company, Inc., New York, 1944; Henrik F. Infield, "Cooperative Living in Palestine," The Dryden Press, New York, 1944.

Seminar in Psychodrama, consisting of lectures with demonstrations.
The sessions take place at the auditorium of the
Psychodramatic Institute

October 13th, "The Warming Up Process in Psychodrama"

October 20th, "The Interview Process in Psychodrama"

October 27th, "Techniques for Theme and Role Analysis"—as they are projected upon the psychodramatic stage

November 3rd, "The Theory of Situational Analysis"

November 10th, "Psychodrama and Play Therapy"

November 17th, Psychodrama and Projective Techniques"

November 24th, "Application of Psychodrama to Crime and Delinquency Problems"

December 1st, "Spontaneity Testing and Training"—and application to vocational and social problems

December 8th, "The Auxiliary Ego in Psychodrama"

December 15th, "The Sociometric Test"

December 22nd, "The Psychodrama and Marriage Problems"

December 29th, "Role-playing as Educational Technique"

January 5th, "Psychodrama and the Rehabilitation of the Military"

January 12th, "Psychodrama as compared with Interview Methods in Personality Diagnosis"

January 19th, "The Relation of Psychodrama to Psychoanalysis"

January 26th, "Psychodrama in the Classroom"

February 2nd, "Spontaneous Drama as Compared Esthetically to the Legitimate Theatre"

February 9th, "Spontaneity and Conserve"

February 16th, "Psychodrama in Social Psychiatric Work"

February 23rd, "Sociodrama—Concepts and Utility"

March 2nd, "Laws of Population as Revealed by Sociometric Test"

March 9th, "Psychodrama in the Treatment of the Neuroses and Psychoses"

March 16th, "Psychodrama and Leadership Training"

March 23rd, "Psychodrama and Training in Democracy"

Time: 8:30 p.m.

MAN IS THE MEASURE

READ BAIN
Oxford, Ohio.

Writing, Neurotic and Normal. An editorial accident "introduced" a man to me a few years ago. We read some things each had written and exchanged a few letters. Though we never have met, I have a vivid "personal idea" of him. If his "personal idea" of me is similarly vivid, we probably shall be "friends for life" and the survivor will retain a warm personal image of the other until the survivor also dies. Should we meet, we would talk freely at once, as long separated friends often do, beginning where they left off—no diffidence, no strained silences, no cautious sparring. We have examined each other by the white light and sharp acid of the written word and have concluded, "He's my kind."

This is a remarkable testimony to the power of the written word, to the mysterious vitality of the graphic symbol. I would suspect some defect in my sensory mechanism which makes me a victim of substitutive fantasies were it not true that many reasonable people regard me as a somewhat lusty fellow. Perhaps it is because my senses are sound, my glands good, and my muscle tonus normal that symbols can take an appearance of reality not wholly delusive. My symbolic friend recently gave me a book he wrote, with a too generous personal inscription. This is an intimate act, since a man's book is a portion of himself. This one happens to be a good book, but any book would tell me a great deal about him, would animate still more the living and growing "personal idea" of him which has become a pleasing part of myself.

That he has found something substantial in my fugitive and feeble writing is vivifying food and drink to my parched and famished ego. It is doubly delightful and quite surprising since he is older and wiser than I, a familiar spirit with many admirable people, a seasoned writer, and a thorn to the smug and complacent. He has a keen and catholic critical intelligence; he has gone hither and yon on the face of the earth, keeping his eyes and mind open all the while. That he should value me is proof of his great capacity for human fellowship and his rare ability to find kernals even in my small strawstack of print.

Certainly I have not been able to find much sustenance for myself in anything I have written or said. To me, it is thin, flat, stale, and unprofitable: barren banality; it merely intensifies my hunger for the righteous-

ness of adequate statement. Reading what I have written only a few years ago usually is painful and disillusioning: I wonder why I ever thought it worth writing in the first place. In most cases, it was not: others have said substantially the same things—and much better. Hence, the rational thing for me would be to play golf (which I do not do very well, either) because golf is pure delight, while writing is the most painful and depressing thing I do. It is my major vice—which I try to keep at a minimum. Hence, it always surprises me to find a student who claims pleasure and profit from my writing; it is deeply satisfying to learn that some of my peers and betters value my writing.

These modest occasional successes keep alive my neurotic compulsion to write and thus increase the viciousness of my vicious circle. When writing is too difficult it often indicates neurosis. Writing, like all forms of normal expression, should be pure joy. I must derive some satisfaction from it, since I do it, but it may be the sickly satisfaction one gets from neurotic habits. It may be the brazen and overt expression of "superiority" compensation for a life-long "inferiority feeling." I have continued through the years only because an occasional appreciator has appeared. This is true of what has been printed but it is also true of the great mass of unprinted writing in my files: some few friends "whom I have in their affection tried" have praised it and there is always the haunting hope that each new effort may please many, perhaps some yet unborn. Cooley says, "If the artist finds no appreciator for his book or picture, he scarcely will be able to produce another." This is true, I think: so I write, painful as it is and pointless as it often seems. Being printed, however, is a fictive form of appreciation; one may hope, but he never is sure, unless the fan-mail or the fair word comes—or perchance the filthy lucre, which is a somewhat satisfying but very impersonal form of appreciation seldom vouchsafed to the artist or scientist.

The graphomania of our time is doubtless produced in large measure by the impersonality of our culture. Graphomania may express almost any form of neurosis or psychosis if the person is literate. Much of it is paranoid. Such authors are unconscious of the demon that drives them; they write easily, fluently, copiously; their psychotic need usually is masked by rationalization—artistic, scientific, or religious. In extreme cases, the result is wordhash; in less extreme cases, elaborate, closely reasoned, and even useful "systems" may be produced; in others, plays, poems, novels, or articles may emerge which bring cash, reputation, or even fame. Psychotic

graphomania is usually graphophilia; the mere act of writing is thrilling pleasure.

The neurotic graphomaniac is a more complicated case, as most neurotics are more complicated in their behavior than psychotics. He writes slowly, laboriously, painfully—with "his heart's blood"; often he is a perfectionist. If he is successful, he also may become a partial graphophiliac. He may learn to write with some ease and fluency, social approval may give effective therapy to his dis-ease, he may become a professional writer—even a literary "figure." Not infrequently, however, his vitality diminishes with his dis-ease and he continues to write the same story over and over, somewhat thinly disguised: he lives off his literary "fat." Someone should study "one-or-two-famous-book" authors to see if there is any merit in this hypothesis. Some neurotics may write a successful book out of their "heart's blood" and thus cure both their neurosis and their graphomania. Of course, their dis-ease may be cured by many other ways, A case in point is the great number of college students who "want to write," and do, especially poetry, until successful matrimony or business or professional life or mere passage of time "cures" them completely.

On the other hand, a neurotic may find writing increasingly painful. This is more likely to be true if appreciators are few. Graphomania even may become graphophobia—he fears to write at all. Fear of criticism, inability to please himself, fear that no one will print his work, fear that he really has nothing to say, etc., may increase his inhibition until all writing is impossible. The paranoid graphomaniac is not disturbed by such considerations. He easily detects a foul conspiracy to keep a good man down and may even defeat the forces of evil by publishing his own work; or he may rest content in the firm conviction that posterity will do him justice.

My own graphomania was certainly psychotic in my youth. It probably was derived from a basic neurosis which I have analyzed to my own satisfaction but which need not be described here. When I was about eleven, the year before I started to school, an unkind Santa Claus brought me for Christmas a yellow pencil, a five-cent Rainbow Tablet an inch and a half thick, and a history of the Spanish American War. I remember (approximately) how the book began: "Admiral Dewey stood on the bridge of the 'Olympia' and said, 'You may fire, Gridley, when you are ready,' and a Mitchell-Mallard shell went crashing across the bows of the Spanish flagship." During the next year, I filled the Rainbow Tablet with rhyming couplets of iambic pentameter celebrating the Yankee heroes

and damning the dastard Dons. In college, I was priggishly proud of my ability to write my themes at the rate of a thousand words an hour—and get A's. This facile logomachy continued even after I entered graduate school, but it became increasingly difficult to write so fast: my psychosis was becoming a neurosis; I began to worry about words and to experience growing fear and anxiety about their effect on others. Hence, it took me two whole weeks to write the 80,000 words in my master's thesis— *A Socialized State,* which I still think a passable job for an ill-educated and cocky upstart. Then I came under the influence of Cooley who impressed me with the fact that "ye are not heard for your much speaking," that good matter can be ruined by poor manner, that there is such a thing as "style" and that it is important, that a man gives hostages to fortune when he publishes words. Cooley was a very slow and careful writer and he was my first intellectual and literary hero. Thus, it took me three months or more to write the measly 120,000 words of my dissertation on the Tillamook Cow and the men—and women—who serve her shrine. Had it not been for Cooley, it might have been a half a million words and even worse than it is.

Since then, writing has become increasingly difficult and distasteful. Now a few thousand words is a forbidding task. Often a 500-word book review is the net result of 2000 written words—but nothing of consequence is lost. The result seldom gives me (or the author I am reviewing!) much pleasure, but it has the virtue of brevity, if not wit. Ellsworth Faris finished what Cooley began by encouraging me to shorten most articles (what editor of a learned journal does not!), but Faris also usually offered good suggestions. I never published any article later (he rejected most of my offerings) which he had read in manuscript that was not improved by his criticism. He was a creative editor. He took the time and trouble and had the ability to help young contributors. At least, he helped me—and mainly by making it more difficult for me to write; he diminished my quantity but improved my quality—I hope.

One aspect of my neurotic graphomania has lost its dis-ease quality. This is the now much neglected and almost defunct art of letter writing. In this form of writing, my graphomania is graphophilia; I can write fully, freely, easily, and with great satisfaction to myself, if not to the recipient. The prerequisites are leisure and a person whom I love or admire. To such persons, the floodgates of my calligraphic verbosity are opened. Since I feel a compulsion to write to such people, the writing is still tinged with neurosis, but it is philiac rather than phobiac. Nothing stops me but time and

the bottom of the third or fourth page. The matter is often trivial and the manner bad but it usually pleases the reader since it commonly is about himself or his ideas. In any case, the result is pleasant and cathartic—at least, to me.

While such writing is easy, copious, and fluent, I do not think it is paranoid because there are not many people to whom I can write in this self-revealing and self-satisfying manner; they must be persons of whom I have a vivid and cherishing "personal idea"; nor do I have any delusion of grandeur that I am doing them a great honor by writing to them; rather, I have a keen sense of gratitude that they should enjoy reading what I have written. I cannot write well or easily to one I dislike or for whose ideas, actions, or way of life I have no respect. In writing to a cherished and cherishing person, I doubtless find freedom and joy by identification with one I imagine to be strong, generous, and full of human understanding; with one who will forgive my folly, pardon my shortcomings, understand my confusions—and still like me. Thus I raise myself in the regard of my Imagined Best Self—that hard taskmaster and most severe critic. I think I even could write good letters to historical and literary characters of whom I have vivid "personal ideas": few from literature, many from history. Such writing would afford the writer little satisfaction, however, unless he expected or hoped some living person would read it, or unless he were a paranoid psychotic graphomaniac.

Writing "to order" is much easier for me than writing under my own "steam." It is painful in either case, but I am stimulated when the chance of publication is increased and when I am forced to meet a deadline. Space limitation is also a good protection against the vestiges of my psychotic verbosity. I almost always feel that anything I have written is "poor stuff," but I can bring myself to let it go if I have "promised," and if I can excuse its poor quality on the plea of space and time limitations.

Reading and other experience should make a full man; disciplined writing should make a precise man—and an empty one, to paraphrase the great vice-chancellor, whose vice, I assume, was paranoid graphomania. Normal men write only when they have something to say; thus, they are "emptied" and should be prepared for receiving new experience. The rhythm of filling and emptying is a significant aspect of human biological behavior; it has its counterpart in normal symbolic expression. The man who "writes himself out" is likely to be a neurotic or psychotic character. His rigid, compulsive habit of life limits his intake; he does not grow either in knowledge or wisdom unless he develops the habit of normal filling and empty-

ing, gestation and delivery. Such persons will never be able to say all they have to say since they will be experiencing new things continually and learning new things from their experience.

Thus I conclude that much of the writing in our culture has a neurotic or psychotic origin and content, but we should not forget that many normal people also write. For them, writing is neither too difficult nor too easy; it is a useful tool, like normal reading—a means to an end. It is hard to judge the value of writing from its genesis. Some psychogenetic writing is obviously much more valuable than the normal writing of mediocre men. The state and trend of the culture, as well as the form and content of the writing, determine its value: how it "works" in that organic whole which *is* culture. In general, however, normal writing is much more likely to be sound, both as to matter and manner. The matter of the neurotic is likely to be highly subjective and narrow; the manner, affected and over-nice. The matter of the psychotic is also likely to be subjective and un-realistic and also repetitive; the manner, loose and muddled. Writing may be a trade or a profession, of course, and like all trades and professions, it may be practiced by both psychopathic and normal people. A tuberculosis specialist may be dying of tuberculosis and still may cure many patients; he may even be a better specialist if he has been cured of the disease. A psychopathic writer may make a considerable contribution even though his writing is merely an expression of his neurotic or psychotic need; he is more likely to be a creative and productive writer if his dis-ease has been cured by the slow therapy of time or the more rapid therapy of the clinic. Good writing is an increasingly necessary adjunct to an increasing number of activities. Normal writing can be done only by normal personalities, though many maladjusted personalities may do useful writing, and even may use writing as an aid in curing their dis-ease. More often, probably, they continue to use writing as a socially acceptable mode of expressing their neuroses and psychoses.

Writing seldom kills or cures the psychopath but it usually helps or hinders his recovery. Thank God we readers can still choose what we read—within limits. I say "within limits," because much reading is also neurotic and psychotic and few of us are unafflicted with psychopathic mild compulsions. Many people read as they do for the same reasons that make others get drunk or go to church or school. I suspect that a very large proportion of the reading now being done in the United States is tinged with such mild and usually harmless psychopathic compulsion. Here also, it helps or hinders the person. We cannot stay in the same place in the real Wonderland of life, no matter how hard we run.

Misprints in Dodd's article "Induction, Deduction, and Causation" in *Sociometry*, May 1943, Vol. VI, No. 2, p. 119-148.

Page & Line	As printed	As corrected
124 — 23	$Z \quad (\quad)$	$Z = (\quad)$
" — 27	X	X_3
125 — 28	$Z_3 = [\quad]E_3/U_3$	$Z_3 = [\quad]^{E_2}/U_2$
" — 30	$[\quad]O/1$	$[\quad]^0/1$
127 — 38	...s subform ...	a
129 — 26	$O_{12} = [\quad]1/1$	$Q_{12} = [\quad]^1/1$
130 — 33	$Z_3 = [\quad].5/1$	$Z_3 = [\quad]^{.5}/1$
	$=[\Sigma(X_1-M_1)2/N].5$	$=[\Sigma(X_1-M_1)^2/N]^{.5}$
	$= \sigma 1$	$= \sigma_1$
131 — 33	$[\quad]1/1$	$[\quad]^1/1$
132 — 24	...^0P denote Socrates ...	$'P$
133 — 28	... in o units ...	σ
" — 29	$[\quad]1/1$	$[\quad]^1/1$
135 — 8	r'	r''
" — 31	$_\sigma X_1$	$_\sigma \overline{X}_1$
138 — 25	> 1.00	< 1.00
" — 35	... second row ... fifth row ...	... first ... fourth ...

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